INL/EXT-13-28597
Revision 2

Alternatives Analysis for the Resumption of Transient Testing Program

November 2013

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EXECUTIVE SUMMARY

An alternatives analysis was performed for resumption of transient testing. Eleven potential alternatives were identified and considered, including U.S. and international facilities. A screening process was used to identify two viable alternatives from the original 11 alternatives. In addition to the two viable alternatives, the alternatives analysis considered a no action alternative as required by the National Environmental Policy Act. The alternatives considered in this analysis include the following:

1. Restart the Transient Reactor Test Facility (TREAT)
2. Modify the Annular Core Research Reactor, which includes construction of a new hot cell and installation of a new fuel motion monitoring device
3. No Action.

Based on the alternatives analysis documented herein, it is recommended to the Department of Energy (DOE) that TREAT be restarted to support transient testing of nuclear fuels and materials, pending the outcome of the ongoing environmental assessment. This recommendation was based on the following because TREAT restart:

- Scored highest in the alternatives analysis, based on input from subject matter experts from across the DOE complex
- Remained the highest scoring alternative over a wide range of criteria weights and scores, as indicated by sensitivity analyses
- Identified as the lowest risk alternative by risk analysis.

The TREAT alternative represents the best value to the government. Based on this analysis, the major advantages of TREAT include the following:

- The facility has the ability to supply prototypic neutron conditions to longer sections of nuclear fuel during experiments.
- There is dedicated availability to support transient testing for the DOE-Office of Nuclear Energy mission.
- Existing access to a co-located hot cell with required capabilities is available.
- Construction of new facilities is not required.
- This is a lower risk to the public because no public roads are required to transport nuclear materials in support of transient testing. [a]
- There is a lower risk to safeguards and security concerns because transport of nuclear materials to support transient testing is limited to non-public roads and DOE-controlled areas.

[a] Risk to the public by use of public roads to transport nuclear fuels and materials will be evaluated during the National Environmental Policy Act process.

NOTE:
This document presents the alternatives analysis for the Resumption of Transient Testing Program (RTTP). DOE has not made a decision on an alternative to pursue for RTTP. The decision will be made following all required analyses and an evaluation of the impacts of reasonable alternatives in accordance with the National Environmental Policy Act of 1969. The information provided herein is presented for planning purposes and supports scoping and alternatives evaluation. The use of words indicating requirements or specifying intention, such as "shall" or "will," are used for the convenience of discussion or to indicate requirements or activities that are conditioned on DOE's eventual decision. Such usage should not be construed to mean that a final selection of an alternative has been made.

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ACRONYMS

ACRR	Annular Core Research Reactor
ATR	Advanced Test Reactor
D&D	decontamination and decommissioning
DOE	Department of Energy
HFIR	High-Flux Isotope Reactor
INL	Idaho National Laboratory
LCC	life-cycle cost
NEPA	National Environmental Policy Act
ORNL	Oak Ridge National Laboratory
RTTP	Resumption of Transient Testing Program
SNL	Sandia National Laboratories
TREAT	Transient Reactor Test Facility

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1. INTRODUCTION

The U.S. Department of Energy (DOE) has a need to test nuclear fuels under high-speed and high-energy pulse conditions to study fuel transient behavior. Testing fuel behavior in a prototypic neutron environment under high-power, accident-simulation conditions is an essential step in licensing new nuclear fuels for use in existing and future U.S. nuclear power plants. Additionally, modern fuel system development and design increasingly relies on modeling and simulation efforts that must be informed and validated using specially designed material performance separate effects studies. These studies will require a testing platform with the ability to support variable scale, highly instrumented experiments. To meet this need DOE approved Critical Decision-0 and the "Mission Need Statement for the Resumption of Transient Fuel Testing" on December 3, 2010.[1]

Following approval of the mission need statement, a programmatic analysis of alternatives[2] was performed. Following completion of the programmatic analysis of alternatives, it was determined that an additional screening requirement (go/no-go criteria) was needed to provide real-time fuel motion monitoring to fully support the transient testing mission need. Subsequently, this alternatives analysis was conducted with the additional real-time fuel motion monitoring screening requirement as described herein. This report identifies the recommended preferred alternative resulting from this alternatives analysis.

2. Alternatives Analysis Purpose and Scope

The purpose of this alternatives analysis is to evaluate the alternatives for providing transient testing capability and to identify a recommended preferred alternative. This analysis is based on a programmatic analysis of alternatives[2] performed by a team of subject matter experts from the following:

- Argonne National Laboratory
- Idaho National Laboratory (INL)
- Oak Ridge National Laboratory (ORNL)
- Sandia National Laboratories (SNL)
- Independent contractor familiar with transient testing and licensing of nuclear fuel and materials.

The subject matter experts provided information regarding facility capabilities, identified a benchmark transient testing matrix that described the range of transient tests required to support future fuel development, provided cost data for selected alternatives, scoring of alternatives, supported development of weighting criteria, scored the alternatives, and reviewed the final report.

Alternatives considered in this alternatives analysis are capable of performing the following:

- Preparatory and characterization activities conducted in a hot cell, including the following:
  - Radiation shielded cask receiving/shipping of experiments
  - Radiation shielded fuel and material characterization of test articles before and after irradiations
  - Radiation shielded transient test assembly, disassembly, and handling
  - Radiation shielded sample sizing, specimen preparation, final sample storage, and archive.
- Performing transient testing in a test reactor capable of supplying a prototypic neutron environment
- Monitoring selected experimental parameters during transient testing, including real-time fuel motion monitoring

Additional information regarding the alternatives analysis is provided in the following subsections.

2.1 Transient Testing Capability Gap

The development and testing of advanced nuclear fuels to improve nuclear reactor sustainability and performance, to reduce the potential of proliferation of nuclear materials, and to advance the nuclear fuel cycle will be needed for at least 40 years.[1] This capability will be needed for all nuclear fuel types, including fuels for light water reactors, high-temperature gas reactors, and fast reactors such as liquid metal reactors. For these reasons, the resumption of transient nuclear fuel testing is essential to the DOE Office of Nuclear Energy research and development mission and the national nuclear fuel development program.

Significant transient testing of nuclear fuels has not been conducted in the United States in over a decade, and there are very few operating test facilities in the world where transient testing of prototype-scale fuel pins can be conducted. Additionally, most of the transient fuel test reactors lack the in situ, real-time imaging technology (i.e., using a neutron detection system such as a hodoscope) to see fuel motion during rapid transient excursions; nor do they provide line-of-site access that would permit access of advanced sensor equipment that would detect real-time pellet clad interaction or TRISO kernel and particle layer interactions during rapid transient excursions. Transient test reactors without real-time fuel motion monitoring are able to induce the specific phenomenological changes, but must rely on post-irradiation examination to determine the final damage state. Relying on post-irradiation examination alone provides no information about time evolution of the fuel damage, which is important to develop a thorough understanding of the underlying science of fuel behavior. In order to successfully develop and license fuels, an understanding of nuclear fuel phenomenology at millisecond to second time scales is needed. This type of research and development requires the use of transient testing to conduct integral effect tests to verify time-dependent fuel performance phenomena.

Detailed transient testing capability also is needed now for screening advanced fuel concepts in support of the Office of Nuclear Energy roadmap imperatives. Because fuel development is a lengthy and expensive activity, any early identification of fuel performance limitations obtained through transient testing is advantageous.

2.2 Alternatives Considered

The analysis considered 11 potentially viable alternatives, including U.S. and international facilities. A screening process was used to identify viable alternatives that met all the requirements for performing transient testing. Two viable alternatives and a no action alternative, consistent with the requirements of the National Environmental Policy Act (NEPA), were evaluated in the alternatives analysis. The alternatives evaluated in this analysis included the following:

1. Transient Reactor Test Facility (TREAT), INL

   This alternative involves restarting TREAT. TREAT was specifically designed and built to test prototypic-sized reactor fuel pins and bundles under transient overpower accident conditions. A wide range of power transients can be generated, including shaped or multiple peaks lasting several seconds, single bursts (by rod step) that last from 70 msec to several seconds, and extended steady-state operations – the full range that is required to perform transient experiments. TREAT has an active fuel height of 48 in. and is equipped with a hodoscope that provides in situ time-resolved, real-time images of fuel behavior under prototypic neutron irradiation. TREAT is located near the Advanced Test Reactor (ATR) and operating hot cell facilities at the Materials and Fuels Complex designed to receive, handle, and process irradiated nuclear fuel assemblies, construct test experiment assemblies with either fresh or irradiated fuels, receive the tested transient experiments containing failed fuel, and perform post-irradiation examination on the failed fuel. The proximity of ATR and the Materials and Fuels Complex hot cells would reduce the use of public roads to complete the transient testing mission. TREAT was last operated in 1994 and has been in a safe-shutdown condition since that time. Prior to restart, the data acquisition system, reactor control system electronics, electronic

components of the time-resolved imaging system (hodoscope), and other systems will be evaluated because of their age and advancements made in electronics since they were installed. It is anticipated that these systems may need to be refurbished or replaced.

2. Annular Core Research Reactor (ACRR), SNL

   ACRR currently is operational and is used to support the pulsed neutron testing of materials, components, and equipment designed for use in high-neutron pulse conditions. ACRR was used for severe fuel damage experiments for the Nuclear Regulatory Commission in the 1980s and for DOE testing of New Production Reactor fuel and other experiments. Like TREAT, ACRR can support the range of power pulses required to support transient testing. The active core height is 20 in. The height can be increased to approximately 39 in. with flux shaping. Because ACRR is not located near hot cell facilities capable of receiving, handling, and processing irradiated nuclear fuel assemblies, this alternative includes construction of a new hot cell to assemble complicated loop experiments near ACRR and uses hot cell capabilities at INL for pre and post-transient examinations. The capabilities of the new hot cell would be limited to assembly and disassembly of transient tests because construction of a hot cell capable of performing all required activities to prepare and characterize transient test samples is cost prohibitive. This alternative also requires construction of a new hot cell facility and installation of a new fuel motion monitoring device into ACRR to support real-time fuel motion monitoring.

3. No Action

   This alternative involves use of existing facilities at ACRR, ATR, and other U.S. and international facilities to perform small-scale static capsule transient irradiations on fresh fuel without fuel motion monitoring. Pre and post-test examinations would be performed in existing DOE facilities. This alternative would preclude nuclear fuel developers from conducting the full range of transient testing to support development of more advanced nuclear fuel. Licensing and deployment of new nuclear fuels would proceed based solely on partially validated computer modeling and results of new small-scale static capsule testing in existing facilities. This strategy would add considerable risk to the deployment of new types of fuels because, historically, no nuclear fuels have been licensed for use in U.S. reactors based solely on data from computer modeling and simulation. In this alternative, no prototypic loop testing or fuel motion monitoring would be completed.

Other alternatives were considered in the analysis, but were not evaluated because they did not meet the requirements (see Section 2.3) or (in the case of a new transient test reactor) were cost prohibitive. Other alternatives considered but not evaluated include the following:

- ACRR/new transporter – utilize existing capability at ACRR and develop and design a new cask and transporter to transport complicated loop experiments from existing hot cell facilities at INL and ORNL to and from ACRR
- ATR – utilize existing capability at ATR to support transient testing and existing hot cell facilities at INL
- High-Flux Isotope Reactor – utilize existing capability at the High-Flux Isotope Reactor and the Irradiated Fuels Examination Laboratory at ORNL to support transient testing and existing hot cell facilities at ORNL
- Construction of a new transient test reactor
- Missouri University Research Reactor – utilize existing capability at the Missouri University Research Reactor to support transient testing and existing hot cell facilities at INL or ORNL
- CABRI – utilize existing capability at CABRI I (France) to perform all transient testing

- Nuclear Safety Research Reactor – utilize existing capability at the Nuclear Safety Research Reactor (Japan) to perform all transient testing
- Impulse Graphite Reactor – utilize existing capability at the Impulse Graphite Reactor (Kazakhstan) to perform all transient testing.

2.3 Goals and Requirements (Go/No-Go Criteria)

The analysis identified a hierarchy of goals, requirements, and criteria against which the alternatives were measured as described in PLN-3965, "Resumption of Transient Testing of Nuclear Fuels Analysis of Alternatives Plan."[3] The seven goals and their associated two requirements (go/no-go criteria) were derived from the mission need statement[1] and are shown in Figure 1. Goals are statements of desired states, responses, or outcomes relative to the alternatives being evaluated. Requirements are conditions that any acceptable solution to the problem must meet. Requirements are used to eliminate non-compliant alternatives from further consideration.

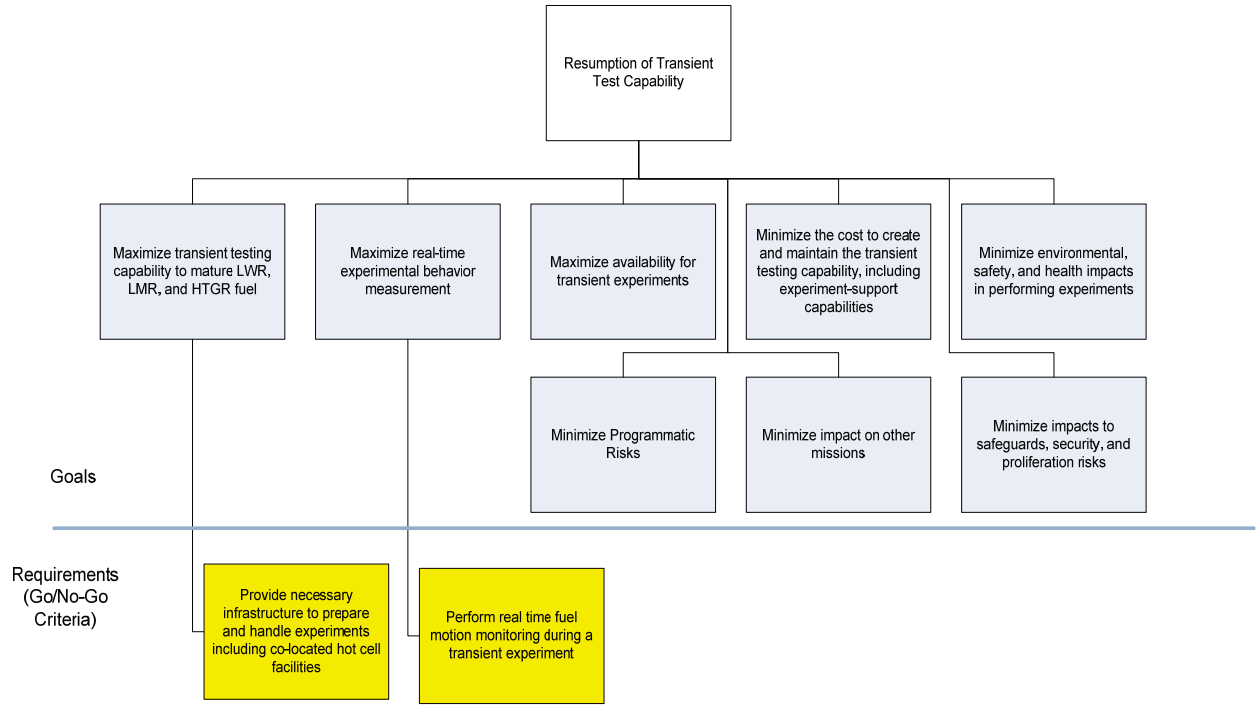


Figure 1. Goals and requirements (go/no-go criteria) for the resumption of transient testing alternatives analysis.

2.4 Transient Testing Capability Criteria and Stakeholder Weighting

The capabilities required to support transient testing are outlined in the mission need statement.[1] Specific evaluation criteria for the alternatives analysis were generated by the subject matter experts, based directly on the capabilities identified in the mission need statement to allow scoring and ranking of viable alternatives.[2] Criteria were defined to provide an objective measure as to how well each alternative satisfies the identified transient testing goals. The criteria were weighted for different stakeholder groups to reflect their relative importance. A complete list of criteria and associated stakeholder weight sets are provided in Appendix A.[2] A summary of the criteria for the alternatives analysis is provided as follows:

1. Reactor is capable of performing the experiments described in the benchmark transient experiment list (Appendix B, Section B-1[2]), provides a wide variety of transient pulse characteristics

(Appendix B, Section B-2) that range from short pulses of 100 msec to longer, complex, shaped transients up to 20 sec that match experimenter defined profiles, and is able to accommodate both fresh and irradiated fuel samples, including those with high minor actinide content.

2. Reactor is equipped to allow monitoring of fission product release, temperature, pressure, coolant velocity, and coolant chemistry throughout the transient (Criteria 18 and 19).
3. Reactor is available to perform the transient experiments of interest (Criteria 20 through 22).
4. The cost of establishing the required transient test capability and performing transient experiments is minimized (Criteria 23 and 24).
5. Impacts to environment, safety and health, security, and proliferation are minimized (Criteria 25 through 29).
6. Technical performance, cost, and schedule risks are minimized (Criteria 30 through 33).
7. Impact on other facility missions or users is minimized (Criterion 34).

2.5 Life-Cycle Cost Estimate

Life-cycle cost (LCC) estimates were prepared for the two viable alternatives. The TREAT estimate meets the definition of a Class 5 estimate in accordance with the Association for the Advancement of Cost Engineering International Recommended Practices, No. 17R-97, *Cost Estimate Classification System*, and No. 18R-97*, Cost Estimate Classification System – As Applied in Engineering, Procurement and Construction for the Process Industries*, dated January 15, 2011. The ACRR estimate is a preliminary Class 5 estimate, indicating that information associated with this alternative (e.g., new construction activities) is not of sufficient maturity to classify in accordance with the Association for the Advancement of Cost Engineering International guidance.

To facilitate comparison, the LCCs have been divided into four general categories: (1) total program cost for the Resumption of Transient Testing Program (RTTP), (2) life-cycle operations, (3) science coordination, and (4) decontamination and decommissioning. A brief description of each major effort, a summary of the LCC estimate, and a brief comparison of the alternatives is provided in this section.

The RTTP cost for both alternatives includes all activities between approval of the Mission Need Document and successful completion of an Operational Readiness Review for resumption of transient testing. TREAT RTTP costs include assessment and refurbishment of existing equipment or replacement of obsolete systems. ACRR RTTP costs include construction of a new hot cell and installation of a new fuel motion monitoring device into ACRR.

Life-cycle operations include facility operations costs for the 40-year transient testing mission. The facility operations costs are based on an average of 10 transient experiments per year. The Science Coordinator function includes preparation of an experimenter's guide for transient experiments and funding for a scientific coordinator to establish a transient testing program. The estimated cost of decontamination and decommissioning (D&D) is included for illustrative purposes. Both TREAT and ACRR are existing facilities that will incur D&D costs regardless of whether they are selected to perform transient testing in the future. The LCC does not include the costs for experiments and post-irradiation examination that will be funded by DOE and non-DOE programs. The LCC for resumption of transient testing is shown in Table 1. For additional detail regarding calculation of the LCC, see Appendix C.

Table 1. Life-cycle cost for TREAT and ACRR alternatives for resumption of transient testing. The cost range shown represents a cost uncertainty of -20% to +35% which is consistent with a Class 5 estimate.

Activity	TREAT (Millions)	ACRR (Millions)
RTTP[1,2] – includes the costs of re-establishing a transient testing capability in the United States	$46 to $74	$143 to $238
Science Program Re-Establishment – includes preparation of approach to conducting experiments, refurbishment of experiment handling equipment, refurbishment/installation of a fuel motion monitoring device, and scientific coordinator support to establish a transient testing program	$10 to $16	$24 to $41
Life-Cycle Operations[3] – includes operations costs required to support 40 years of facility operations (FY 2019 to FY 2058), maintenance consistent with the RTTP mission need, and D&D[4] of the facility upon completion of its mission life	$439 to $741	$389 to $656
Science Program Integration[3] – includes scientific coordinator to support transient experiments for 40-year transient testing mission (FY 2019 to FY 2058)	$31 to $53	$31 to $53
Life-Cycle Cost Estimate for RTTP and Long-Term Operations through Successful Completion of an Operational Readiness Review[5]	$526 to $884	$587 to $988

1- The RTTP costs are escalated to 2016 dollars. This reflects the midpoint of when the work associated with reestablishing a transient testing capability would be performed.

2- Life-cycle costs do not include costs associated with maintaining the facility and existing capabilities necessary to support current mission activities.

3- The total cost for Life-Cycle Operations is escalated to the midpoint of the 40-year transient testing mission.

4- The total cost for D&D is escalated to the end of the 40-year transient testing mission to reflect when D&D would be completed. The D&D cost estimate is based on the actual cost per square foot associated with recent D&D of a test reactor at INL. It is assumed that the total area to be D&D is the same for TREAT and ACRR.

5- A preliminary analysis of risk events for the RTTP has been conducted and management reserve/contingency for these events is identified. Additionally, a preliminary analysis of cost savings opportunities has been identified. Based on the current understanding of the programmatic scope, funding for risk event management reserve/contingency will not be specifically requested for program execution. Prior to establishment of the program baseline, both the risks and opportunities will be evaluated to establish the potential impact on the program baseline.

A comparison between the two alternatives indicates that the LCC (see Table 1) are similar. The major cost differences between the alternatives are as follows:

- The TREAT alternative requires refurbishment of existing equipment and replacement of obsolete systems. This is less expensive than the activities required for the ACRR alternative - construction of a new hot cell for experiment loop handling and installation of a new fuel motion monitoring device into ACRR.

- The TREAT alternative is assumed to be dedicated to the transient testing mission, whereas ACRR would support multiple customers. ACRR has several customers and operating costs associated with transient testing would be limited to the time required to support testing. Based on this assumption, long-term ACRR operations are less costly.

2.5.1 Risk Event Management Reserve, Department of Energy-Held Contingency, and Cost Savings Opportunities

Risk management is a continuous process, where risks are identified, monitored, and mitigated. The goal of risk management is to improve program performance and decrease the likelihood of cost overruns, schedule delays, and compromises in quality and safety. The major risks for RTTP have been identified in a preliminary risk register for the TREAT alternative. A risk register for the ACRR alternative has not been developed. As a result, risk event management reserve and DOE-held contingency for the ACRR alternative is scaled from the risk event management reserve and contingency for the TREAT alternative. Management reserve and contingency do not apply to life-cycle operations or the science program because annual budget requests will be made based on the requirements for maintenance/operation of the facility and specific annual research objectives.

For TREAT, the internal program risks with the largest potential cost impact are related to existing conditions. For example, it is assumed that the condition of TREAT fuel is acceptable. This assumption is based on the operating history at TREAT, results of previous fuel inspections, and the very low expected degradation rate of the zirconium-clad fuel. In addition, TREAT operations from 1959 to 1994 utilized approximately 37% (see Appendix D) of the total TREAT fuel capacity, leaving approximately 63% of the capacity for future operations. This remaining capacity is expected to meet the entire 40-year mission need. However, if future fuel inspections show that the fuel cannot be used to support operations, it would need to be replaced. The baseline cost estimate does not cover replacement of TREAT fuel, which is consistent with historical information. While it is unlikely, the risk summary includes the possibility that 10 to 50 fuel elements would require replacement, following performance of a future fuel inspection activity. Management reserve is based on internal program risks.

The DOE-held contingency is based on risks that are external to RTTP for both alternatives. One of the external risks identified for the program is delays in receipt of adequate funding that delay the schedule and result in cost escalation.

Cost savings opportunities have been identified for the TREAT alternative. Cost savings opportunities for the ACRR alternative have been scaled from the savings identified for the TREAT alternative. The calculation of risk event management reserve, risk event DOE-held contingency, and cost savings opportunities for both alternatives are provided in Appendix E.

2.6 Scoring

Each alternative was assigned a score for each of the transient testing capability criteria (Section 2.4) by the subject matter experts. The scoring is shown in Appendix F.

3. RESULTS

The go/no-go analysis evaluated both alternatives against the transient test requirements shown in Figure 1. Alternative 3 (the no action alternative) did not meet the threshold requirements and was eliminated from further consideration. Alternatives 1 and 2 both met the threshold requirements. To complete the scoring process for the viable alternatives, each alternative was assigned a score of zero to one by the subject matter experts for each criterion (see Appendix G). The scores were multiplied by the criteria weights (see Appendix A) and then summed to generate a combined score for each alternative (see Appendix F). The combined scores for the two viable alternatives for each weight set are shown in Figure 2. The TREAT alternative scored higher than the ACRR alternative for each of the stakeholder weight sets considered.

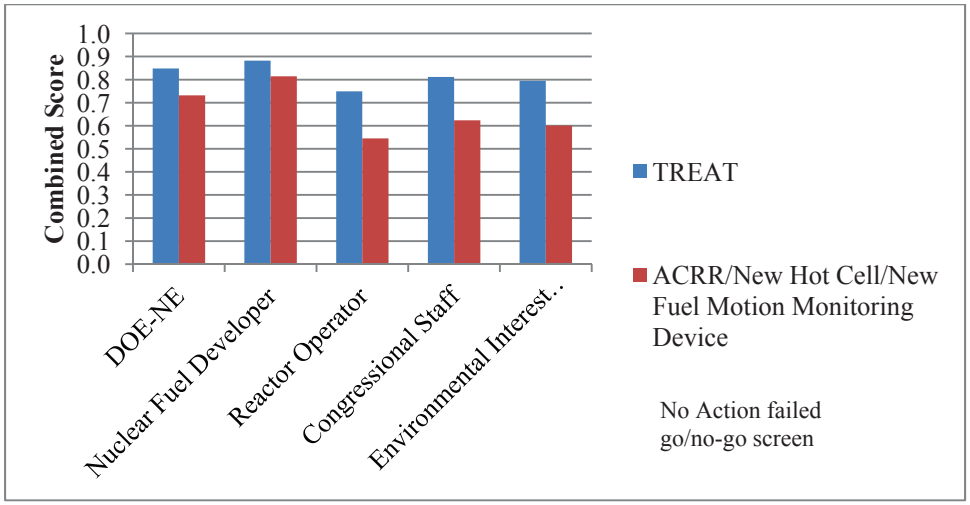


Figure 2. Combined scores for the two viable alternatives for the weight sets considered.

3.1 Risk Analysis

Risks associated with resumption of transient testing were included in the overall alternatives analysis. The overall risk of each alternative is related to the sum of the relative risks, with the lowest risk alternative having the lowest overall risk score. The risk scores were converted from the utility scores shown in Appendix G using the formula:

1-utility score = risk score

Nine specific risks were evaluated for both alternatives. For example, Criterion 33 of the alternatives analysis is "Risk of failing to meet the schedule for reestablishing the transient test capability." For TREAT, the risk score of 0.2 is based on the relative risk of performing refurbishments and replacements of existing equipment to meet the schedule need date of 2018. For ACRR, the risk score of 0.5 is based on the relative risk of obtaining line item funding and completing construction of a new hot cell and installation of a new fuel motion monitoring device into ACRR to meet the schedule need date of 2018. Both alternatives have risks, but the risk is higher for the ACRR alternative. A summary of the risks considered in the analysis and a comparative score for the two viable alternatives is provided in Table 2. Based on this analysis, the TREAT alternative has a lower overall risk than the ACRR alternative.

Table 2. Summary of risk scoring for TREAT and ACRR alternatives.

Risk Description	TREAT Score[1]	ACRR Score[1]	Scoring Explanation
Risk of significant impact to environmental discriminators (Criterion 25)	0.33	0.6	TREAT—low air and water emissions ACRR—low air and water emissions, requires construction of a new hot cell
Risk of impact to safety and health of public (Criterion 26)	0	0.67	TREAT—no offsite transportation on public roads ACRR—requires offsite transportation of irradiated fuel on public roads
Risk of impact to safety and health of workers (Criterion 27)	0.67	0.67	TREAT—requires additional radiological workers to operate the reactor ACRR—requires additional radiological workers to operate the new hot cell
Risk of impact to safeguards, security, and proliferation (Criterion 28)	0	0.67	TREAT—all transportation of irradiated fuel is on non-public roads, no offsite transportation required ACRR—most transportation of irradiated fuel is on public roads
Technical performance risk (Criterion 30)	0.1	0.3	TREAT-–cold standby since 1994; limited experienced personnel available to support startup ACRR—requires installation of a new fuel motion monitoring device and construction of a new hot cell
Cost risk (Criterion 31)	0.85	0.76	TREAT—uncertainty with costs for refurbishing and replacing systems that have been in cold standby since 1994 ACRR—uncertainty with costs for a new hot cell and new fuel motion monitoring device
Risk of not being able to perform experiments in a timely manner (Criterion 32)	0	0.67	TREAT—dedicated to transient testing mission ACRR—requires coordination with other customer needs and coordination of offsite transportation
Risk of failing to meet the schedule for reestablishing the transient test capability (Criterion 33)	0.2	0.5	TREAT—uncertainty with schedule to complete system refurbishment and replacement activities ACRR—uncertainty with schedule to initiate and complete a line item project that includes construction of a new hot cell and design and install a new fuel motion monitoring device
Risk of significant impact on other facility missions or users (Criterion 34)	0.1	0.5	TREAT—some coordination with other Hot Fuel Examination Facility users required for pre and post-test evaluations ACRR—coordination between DOE and other customer needs and coordination with other Hot Fuel Examination Facility users for pre and post-test evaluations
Total Risk Score	**2.25**	**5.34**	

1. Risk scores were converted from the utility scores in the alternatives analysis with the formula Risk Score = 1 – Utility Score.

3.2 Sensitivity Analysis

Sensitivity analyses were performed to evaluate how errors or uncertainties in the assignment of goal/criterion weights or alternative scores might affect the outcome, specifically, the overall alternative ranking and the highest scoring alternative. The sensitivity analyses indicated that the ranking results were very robust, meaning that TREAT remained the highest scoring alternative over a wide range of variation in criteria weights and scores (see Appendix H).

3.3 Maintainability

Both TREAT and ACRR have operating histories that indicate no significant differences in maintainability.

3.4 Regulatory Requirements

Both viable alternatives would have to be operated in accordance with all applicable regulatory requirements.

3.5 Safety

Both alternatives will need to revise and implement a documented safety analysis that conforms to the requirements of 10 CFR 830, "Nuclear Safety Management."

4. ADVANTAGES SUMMARY

Following the analysis, the results were evaluated to determine the major discriminators between the viable alternatives. Based on this evaluation, the TREAT alternative scored higher due to its:

- Ability to supply prototypic neutron conditions to longer sections of nuclear fuel during experiments
- Dedicated availability to support transient testing for the Office of Nuclear Energy mission
- Existing access to a co-located hot cell with all required capabilities
- Construction of new facilities is not required
- Lower risk to the public because no public roads are required to transport nuclear materials in support of transient testing[b]
- Lower risk to safeguards and security concerns because transport of nuclear materials to support transient testing is limited to non-public roads and controlled areas.

5. BOUNDING COST ESTIMATE FOR THE RECOMMENDED PREFERRED ALTERNATIVE

The bounding cost estimate for the TREAT alternative includes RTTP activities necessary to restart the TREAT Reactor, including refurbishments and replacements of reactor systems and required operations support to reestablish the operating conditions and processes associated with conducting transient testing. The Science Program includes development of experimental handling practices, refurbishment of experiment handling equipment, refurbishment of the hodoscope, and integration between the experimental/science community and RTTP. The total cost to reestablish a transient testing capability includes all activities between approval of the mission need statement and successful completion of a readiness review to restart TREAT reactor operations, as presented in Table 3.

[b] The risk to the public by the use of public roads to transport nuclear fuels and materials will be evaluated during the NEPA process. The results of the NEPA process will be used to update the information presented in this report.

Table 3. Total cost to reestablish transient testing capability for the TREAT alternative.

Activity	TREAT		
	Low (Millions)	Mid (Millions)	High (Millions)
Total cost to reestablish facilities for transient testing at TREAT – including completion of an operational readiness review **(RTTP bounding estimate)**[1, 2, 3]	$46	$56	$74
Science Program Reestablishment[4] **–** preparation of approach to conducting experiments, refurbishment of experiment handling equipment, refurbishment of the TREAT hodoscope, and scientific coordinator to establish a transient testing program	$10	$12	$16
Total Cost to Reestablish Transient Testing Capability - Reestablishes a transient test capability at TREAT and a supporting transient testing science program	$56	$68	$90

1- The costs are escalated to 2016 dollars, the midpoint of RTTP activities. Based on the unknown, unknowns associated with a Class 5 cost estimate the low and high range percentages were developed using DOE Cost Estimating Guide 413.3-21, Table 6-2. Per the direction of the program team, a low range of -20% and a high range of +35% were used to develop the total range for the cost estimate.

2- A preliminary analysis of risk events for the RTTP has been conducted and management reserve/contingency for these events is identified. Additionally, a preliminary analysis of cost savings opportunities has been completed. Based on the current understanding of the programmatic scope, funding for risk event management reserve/contingency will not be specifically requested for program execution. Prior to establishment of the program baseline, both the risks and opportunities will be evaluated to establish the potential impact on the program baseline.

3- Costs in the table do not include costs associated with maintaining the facility and existing capabilities necessary to support current mission activities.

4- The science program component is funded by non-Idaho Facilities Management funding sources.

6. CONCLUSION AND RECOMMENDATION

Based on this analysis, the recommended preferred alternative is Alternative 1, TREAT. The recommended alternative is dependent on the results of the NEPA process. This decision was based on the following:

- TREAT scored highest in the alternatives analysis
- The scoring was based on unanimous input from subject matter experts
- The risk analysis identified TREAT restart as the lowest risk alternative
- Sensitivity analyses indicated that the ranking results were very robust, meaning that TREAT remained the highest scoring alternative over a wide range of criteria weights and scores.

The TREAT alternative represents the best value to the government.

7. REFERENCES

1. U.S. DOE, "Mission Need Statement for the Resumption of Transient Fuel Testing," DOE Office of Nuclear Energy, December 2010.
2. INL/EXT-12-26840, *Final Report for the Resumption of Transient Testing of Nuclear Fuels Program Analysis of Alternatives*.
3. PLN-3965, "Resumption of Transient Testing of Nuclear Fuels Analysis of Alternatives Plan," September 2011.

Appendix A
Criteria and Associated Stakeholder Weight Sets for the Alternatives Analysis of Resumption of Transient Testing

The capabilities required to support transient testing are outlined in the mission need statement.[1] Specific evaluation criteria for the alternatives analysis were generated by the subject matter experts, based directly on the capabilities identified in the mission need statement to allow scoring and ranking of viable alternatives.[2] Criteria were defined to provide an objective measure as to how well each alternative satisfies the identified transient testing goals. The criteria were weighted for different stakeholder groups to reflect their relative importance. Stakeholder weight sets were identified for the following:

- DOE-ID
- Nuclear Fuel Developers
- Nuclear Reactor Operators
- Congressional Staff
- Environmental Interest Group.

A complete list of criteria and associated stakeholder weight sets are provided in the following pages of this appendix.

			Weights									
			DOE		Nuclear Fuel Developers		Reactor Operator		Congressional Staff		Environmental Interest Group	
	Criteria	Scoring Explanation	Goal	Criteria	Goal	Criteria	Goal	Criteria	Goal	Criteria	Goal	Criteria
1	Perform transient experiment C1A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	**22%**	20%	**19%**	22%	**6%**	23%	**4%**	20%	**7%**	20%
2	Perform transient experiment C1B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance		20%		11%		23%		20%		20%
3	Perform transient experiment L1A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance		20%		33%		23%		20%		20%
4	Perform transient experiment L1B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance		20%		11%		8%		20%		20%
5	Perform transient experiment L1C	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance		20%		22%		23%		20%		20%
6	Perform transient experiment C2A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	**4%**	13%	**19%**	16%	**11%**	15%	**2%**	13%	**7%**	13%
7	Perform transient experiment C2B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance		13%		5%		15%		13%		13%
8	Perform transient experiment C2C	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance		13%		5%		15%		13%		13%

9	Perform transient experiment L2A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance		13%		21%		8%		13%		13%
10	Perform transient experiment L2B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance		13%		21%		8%		13%		13%
11	Perform transient experiment L2C	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance		13%		11%		13%		13%		13%
12	Perform transient experiment L2D	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance		13%		5%		15%		13%		13%
13	Perform transient experiment L2E	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance		13%		16%		13%		13%		13%
14	Perform transient experiment C3A	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance	7%	25%	6%	25%	4%	25%	2%	25%	7%	25%
15	Perform transient experiment C3B	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance		25%		25%		25%		25%		25%
16	Perform transient experiment C3C	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance		25%		25%		25%		25%		25%
17	Perform transient experiment C3D	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance		25%		25%		25%		25%		25%
18	Measure fission product release and reconstruct fission product release as a function of time	100% Full functionality - real-time 85% Re-creation of fission release throuh capture and post-analysis 67% Full functionality with low risk development and investment 33% Partial functionality 0% No functionality	**13%**	50%	**19%**	33%	**4%**	33%	**14%**	50%	**7%**	50%

19	Monitor and measure the temperature, pressure, coolant velocity, and chemistry throughout the transient	100% Full functionality 67% Full functionality with low risk development and investment 33% Partial functionality 0% No functionality		50%		67%		67%		50%		50%
20	% of the year available for transient experiments	100% 12 months 90% 10 to 11 months 80% 8 to 9 months 50% 6 to 7 months 25% 4 to 5 months 15% 2 to 3 months 0% <2 months	**11%**	43%	**15%**	33%	**3%**	29%	**16%**	33%	**7%**	33%
21	Available time to set up experiments, including reactor outage	100% As long as required 67% 4 to 6 weeks 33% 2 to 3 weeks 0% <2 weeks		29%		33%		43%		33%		33%
22	% reactor available to perform experiments (e.g., number of available slots)	100% Full dedicated to experiment in progress 67% Other experiments compete for reaction conditions, but they can schedule them in 1 to 2 years 50% Requires coordination of three years or more to get on schedule 33% High competition exists for desired slots in reactor (significant cooridnation required) 0% Reactor priorities and schedules effectively eliminate transient experimentation support (already fully burdened)		29%		33%		29%		33%		33%
23	Cost and number of years to create capability (i.e., initial investment needed to provide the transient testing capability)	Linear relationship from $0 to $120 Million investment required	**11%**	50%	**9%**	50%	**22%**	50%	**11%**	50%	**7%**	50%
24	Cost to conduct LWR, LMR, and HTGR experiments	Linear relationship from $0 to $400 Million cost of life cycle operations (does not include the investment cost)		50%		50%		50%		50%		50%
25	Impact to environmental discriminators	100% No impact due to facilities are currently operating and require no upgrades or design basis changes 85% Negligible impact due to use of existing facilities but requires upgrading equipment without change to safety basis 67% Low to medium impact due to use of existing facility with required upgrades and extension of current safety basis to conducte transient testing experiments 50% Medium impact due to requiring new high radiological facility to perform transient experiments 40% Medium impact but new radiological facility attached to another new facility already planned (adding sq ft rather than completely new) 33% Medium to high impact due to requiring more than one radiological facility to conduct transient testing experiments 0% Very high impact due to requiring a new nuclear reactor to conduct transient experiments	**9%**	33%	**2%**	33%	**16%**	29%	**14%**	33%	**36%**	33%
26	Impact to safety and health of public	100% Negligible or very low impact to safety and health of public due to conducting or transporting material in the performance of transient testing experiments 95% Some small number of capsules potentially shipped off site although majority of experiments conducted without transporting on public roads 67% Low to medium impact to safety and health of public from transporting nuclear materials across public roads (1x per experiment) 33% Medium to high impact to safety and health of public resulting from 2x transports per experiment across public roads in conducting transient testing experiments 0% Very high impact to safety and health of public requiring 3x per experiment for transfers of nuclear materials on public roads to conduct transient testing experiments		33%		33%		43%		33%		33%
27	Impact to safety and health of workers	100% Negligible or low impact to safety and health of workers (no dose or increase in radiological workers) as a result of conducting irradiated fuel transient testing experiments 67% Low to medium impact to safety and health fo workers (current workforce obtaining higher dose from additional handling in performance of irradiated fuel transient testing experiments) 40% Marginal improvement over medium to high impact by using existing workers for some early or excess experimental capacity (reduces numbers of new rad workers) 33% Medium to high impact to safety and health of workers due to increase in radiological workers and increase dose from handling due to performance of irradiated fuel transient testing experiments 0% Very high impact to safety and health of workers due to workers and handling where radiological infrastructure is not sufficiently in place to conduct irradiated fuel transient testing experiments		33%		33%		29%		33%		33%

28	Security, transportation and control outside secure areas	100% Negligible or low impact to security, transportation and control measures outside of the transient testing capability area (no outside control area shipping) 67% Low to medium impact to security, trnasportation and contorl measures outside of the transient testing capability area (single shipment on public road to control per experiment) 33% Medium to high impact to security, transportation and control measures outside of the transient testing capability area (two shipments to control per experiment) 0% Very high impact to security, transportation and control measures outside of the transient testing capability area (more than two shipments/experiment to control)	**9%**	50%	**2%**	50%	**6%**	67%	**7%**	50%	**7%**	50%
29	Security, transportation and control within transient testing capability areas	100%- Negligible or low impact to security, transportation and control measures within the transient testing capability area 67%- Low to medium impact to security, transportation and control measures within the transient testing capability area 33%- Medium to high impact to security, transportation and control measures within the transient testing capability area 0%- Very high impact to security, transportation and control measures within the transient testing capability area		50%		50%		33%		50%		50%
30	Technical performance risk	100%-No risk to performing transient experimentation 90% - Low risk to completing needed tests on time, some risk to beginning early to collect baseline data 70%- Low to medium risk to performing transient experimenation, begins early but cannot complete without new hot cell not yet planned 50%- Medium to high risk to performing transient experimenation, begins early but cannot complete without new transporter not yet defined 25%- High to very high risk to performing transient experimenation 0%- Very high or higher to performing transient experimenation	**9%**	33%	**9%**	45%	**16%**	29%	**13%**	25%	**7%**	25%
31	Cost risk	Linear conversion of the contingency costs due to cost estimate uncertainties (range of $ to $75M)		23%		10%		14%		25%		25%
32	Schedule risk to perform experiments	100%- Able to meet needs to required experiments with ability to have excess capacity for international needs (<9 capacity/yr) and can complete ATF schedule by 2022 end date 85%- Could perform ATF and LMR loop test needs (up to 9/yr) and can complete ATF schedule by 2022 end date 67% - Could perform >6 loop tests per year supporting ATF experiment needs and can complete ATF schedule by 2022 end date 50% - Can support ATF with some throughput (6 loop tests per year) and does not delay ATF completion by no more than 2 years 33%- Can support ATF with some throughput (4-5 loop tests per year) and does not delay ATF completion by no more than 4 years 15% Can support ATF with some throughput (3 loop tests or few / year) and delays ATF completion by more than 4 years 0%- Can not meet the experimental needs of the ATF program		11%		27%		29%		25%		25%
33	Schedule risk to resume transient testing	Summary of capsule and loop startup 50%-capsule transient capability by 2015 and 50% for loop transient capability by 2017 (MNS could begin using by date) 45% capsule transient capability by 2017 and 45% for loop transient capability by 2019 (derived MNS must date for loop testing) 35% - capsule transient capability by 2018 and 35% for loop transient capability by 2020 25%-capsule transient capability by 2019 and 25% for loop transient capability by 2021 15%-capsule transient capability by 2020 and 15% for loop transient capability by 2022 5%-capsule transient capability by 2021 and 5% for loop transient capability by 2023 0%-capsule transient capabilityafter 2021 and 0% for loop transient capability after 2023		33%		18%		29%		25%		25%
34	Impact on other facility missions or users	100%- Negligible or no impact to other facility missions or users 95% - Some improvement over low risk due to mutiple facility availability for some experiments to deconflict with other programs 90% - Low risk due to requiring only localized single site coordination to perform experiment 75%- Low to medium impact due to one other facility (multiple sites) to coordinate with 50%- Medium impact due to requiring two coordinations (multiple sites) / experiment for same facility 25% High impact due to more than two coordination facilities (multiple sites) / experiment 0%- Very high impact to other facility missions or users	**7%**	100%	**2%**	100%	**11%**	100%	**18%**	100%	**7%**	100%

Appendix B
Benchmark Transient Fuel Experiments and Transient Pulse Characteristics

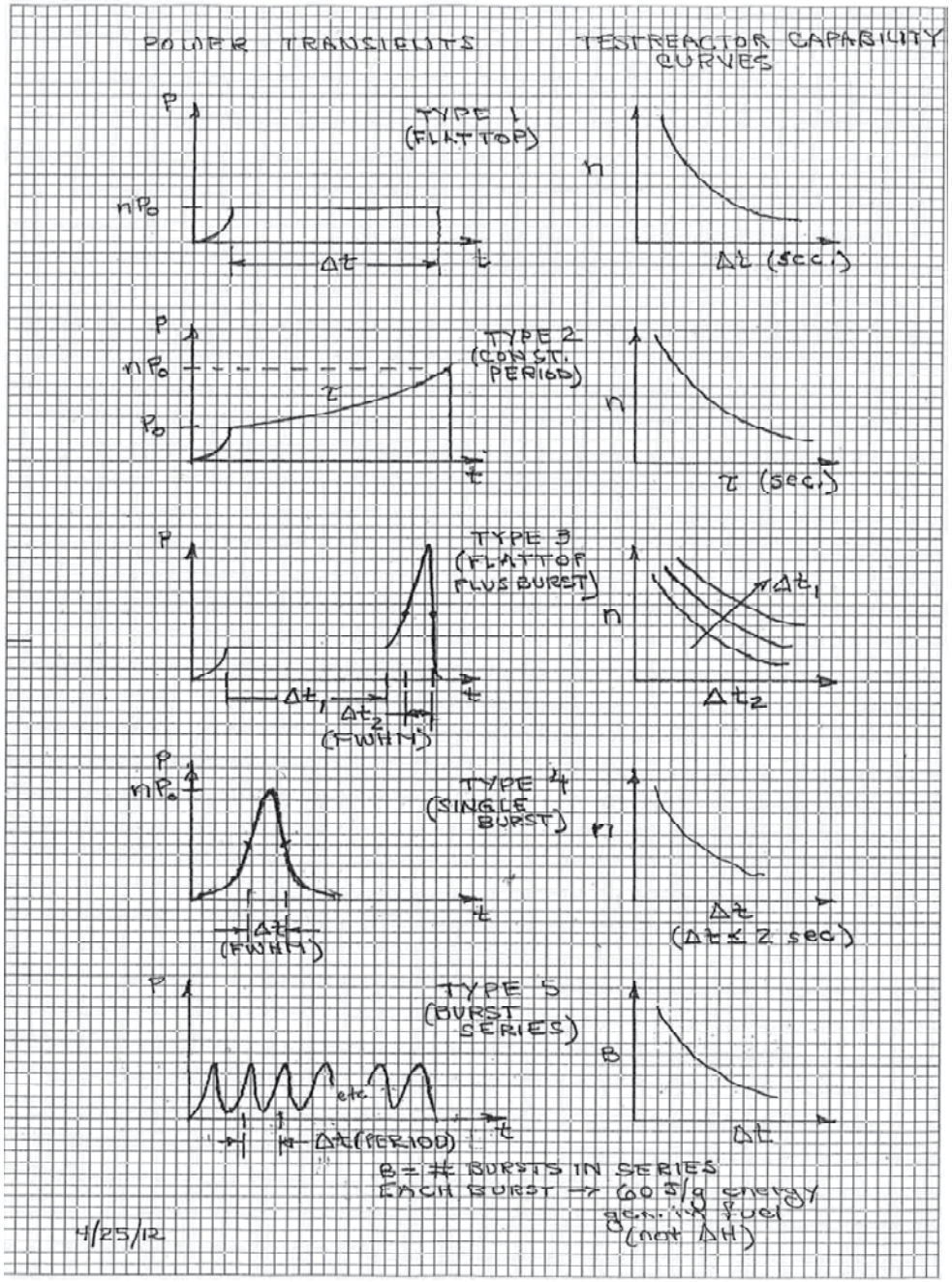
B-1. Benchmark Transient Experiment List

During the programmatic Analysis of Alternatives for the Resumption of Transient Testing Program, the Subject Matter Experts developed a list of potential transient test experiments. The list is intended to provide the range of experiments that would be completed to develop advanced nuclear fuels. The purpose of the list is to determine if potential transient test reactors are able to provide the prototypic neutron environment needed to successfully support the range of transient test experiments needed. The list includes capsule and loop experiments, different coolants, the number of fuel pins or rodlets associated with each test, the fuel configuration, fuel dimensions, fuel form, and the physical size of the test containment. The list of experiments is provided on the next page of this appendix.

changed MHTGR to HTGR	REV 7						To convert table values between inches and centimeters, toggle the conversion factor below between 1.0 and 2.54:												
							inches	times	2.54										
Benchmark Test Name	**Coolant**	**Reactor Type**	**Number of Fuel Pins or Rodlets**	**Fuel Config.**	**Fuel pin cladding OD**	**Fuel height in fuel pin**	**Fuel pin overall length**	**Fuel pin pitch (center-to-center)**	**Fuel form**	**HM linear mass per pin**	**Fissile material equivalent uranium enrichment after burnup**	**ID of primary contain-ment wall**	**OD of primary contain-ment wall***	**Primary contain-ment wall material**	**ID of secondary contain-ment wall**	**OD of secondary contain-ment wall***	**Secondary contain-ment wall material**	**Height of contain-ment**	Cladding thickness
					cm	cm	cm	cm		grams HM per cm	% U235 in HM	cm	cm		cm	cm		cm	cm
CAPSULES																			
C1A	High-pressure water	LWR	1	Rodlet	1.25	3.81	15.24	na	UO2	4.21	1.2	3.175	5.715	Zircaloy	8.26	8.89	Zircaloy	30	0.064
C1B	High-pressure water	LWR	1	>50 cm fuel length	0.96	70.00	100.00	na	UO2	4.80	1.2	3.175	5.715	Zircaloy	8.26	8.89	Zircaloy	203	0.064
C2A	Low-pressure sodium	LMR	1	Rodlet	0.584	3.81	15.24	na	U-10Zr	2.05	50	3.175	5.715	316 SS	8.26	8.89	316 SS	30	0.038
C2B	Low-pressure sodium	LMR	1	Short LMR metallic pin	0.584	34.29	64.01	na	U-10Zr	2.05	50	3.175	5.715	316 SS	8.26	8.89	316 SS	91	0.038
C2C	Low-pressure sodium	LMR	1	Long LMR oxide pin	0.686	91.44	232.16	na	UO2	2.06	35	3.175	5.715	316 SS	8.26	8.89	316 SS	305	0.056
C3A	Low-Pressure helium	HTGR	1	Stack of 4 HTGR fresh compacts	1.270	10.16	15.24	na	UCO	0.50	15.5	2.975	3.255	316 SS	3.28	3.56	316 SS	15	na
C3B	Low-pPressure helium	HTGR	1	Stack of 4 HTGR Medium BU compacts	1.270	10.16	15.24	na	UCO	0.50	11.6	2.975	3.255	316 SS	3.28	3.56	316 SS	15	na
C3C	Low Pressure helium	HTGR	1	Stack of 4 HTGR High BU compacts	1.270	10.16	15.24	na	UCO	0.50	8	2.975	3.255	316 SS	3.28	3.56	316 SS	15	na
C3D	Low Pressure helium	HTGR	3	Stack of 12 HTGR compacts, 4 fresh, 4 med BU, 4 high BU, including spacers/or capsule closures between each set of 4 compacts	1.270	35.56	45.72	na	UCO	0.50	11.7	2.975	3.255	316 SS	3.28	3.56	316 SS	46	na
LOOPS																			
L1A	High-pressure water	LWR	1	>50 cm fuel length (PWR)	0.96	70.00	100.00	na	UO2	4.80	1.2	3.175	5.715	Zircaloy	14.61	15.24	Zircaloy	203	0.064
L1B	High-pressure water	LWR	1	Full-length PWR fuel pin	0.96	381.00	409.96	na	UO2	4.80	1.2	3.175	5.715	Zircaloy	14.61	15.24	Zircaloy	508	0.064
L1C	High-pressure water	LWR	3	Bundle of short PWR pins	0.96	70.00	100.00	1.626	UO2	4.80	1.2	5.08	7.62	Zircaloy	14.61	15.24	Zircaloy	203	0.064
L2A	Low-pressure sodium	LMR	2 or 3	Short LMR metallic pins in separate flowtubes	0.584	34.29	64.01	1.270	U-10Zr	2.05	50	3.175	6.35	316 SS	14.61	15.24	316 SS	178	0.038
L2B	Low-pressure sodium	LMR	2 or 3	Long LMR metallic pins in separate flowtubes	0.686	91.44	232.16	1.524	U-10Zr	2.44	50	3.175	6.35	316 SS	14.61	15.24	316 SS	381	0.056
L2C	Low-pressure sodium	LMR	3	Bundle of short LMR UO2 pins	0.584	34.29	64.01	0.737	UO2	1.73	35	3.175	6.35	316 SS	14.61	15.24	316 SS	178	0.038
L2D	Low-pressure sodium	LMR	7	Bundle of short LMR UO2 pins	0.584	34.29	64.01	0.737	UO2	1.73	35	3.175	6.35	316 SS	14.61	15.24	316 SS	178	0.038
L2E	Low-pressure sodium	LMR	3	Bundle of long LMR UO2 pins	0.686	91.44	232.16	0.838	UO2	2.06	35	3.175	6.35	316 SS	14.61	15.24	316 SS	381	0.056
NOTES:	* Thickness of primary containment wall assumes complete fuel melting. Need for secondary containment assumes test fuel is pre-irradiated and/or contains transuranics. If no fuel melting can be assured, primary containment thickness need only																		
	Assumptions: Default assumption is that test fuel is pre-irradiated and contains transuranics. If this assumption cannot be accommodated, assume test fuel is fresh but contains plutonium.																		
LWR conditions	2250 psi, 300 deg-C coolant																		
LMR conditions	60 psi, 510 deg-C coolant																		

B-2. Transient Pulse Characteristics

The subject matter experts identified specific transient pulse characteristics that are required for a test reactor to meet the mission need statement. The pulse characteristics range from short pulses of 100 msec to longer, complex, shaped transients up to 20 sec that match experimenter defined profiles. The specific pulse characteristics are identified on the next page of this appendix.



Transient type	Description of Transient
1	delta-t ranging from 1 second to 60 seconds. These would be mainly for LMR fuel tests.
2	tau values (e-folding times) from 8 seconds to 80 seconds. These would be mainly for LMR fuel tests.
3	delta-t1 (flattop duration) between 1 second and 10 seconds and burst half-widths (delta-t2) between 0.1 sec and 5 secs. These would be for both LMR and LWR fuel tests.
4	FWHM (delta-t) between 50 ms and 1000 ms. These would be for both LMR and LWR fuel tests.
5	delta-t from peak to peak between 1 and 5 seconds, and FWHM of each burst between 30 and 100 millisec. These would be only for BWR fuel tests.

Appendix C
Detailed Life Cycle Cost Estimates

The detailed cost estimates for the TREAT and ACRR alternatives are presented in this appendix. Table C-1 provides background reference information to show where specific information was collected to prepare Table 1 in Section 2.5 of this report. Table C-2 provides background reference information to show where specific information was collected to prepare Table 3 in Section 6.

Table C-1. Source of cost estimate numbers presented in Table 1 in the main body of this report.

Activity	Source Material for TREAT Cost Estimate	Source Material for ACRR Cost Estimate
RTTP	See page C-7, Resumption of Transient Testing Program - point estimate of $56,401,230. The range shown in Table 1 covers the uncertainty of -20% to +35% which applies to all but actual costs from FY-11 to FY-13 {($56,401,230 - $5,899,691) - 20%/+35% + $5,899,691 which gives range of $46M to $74M.}	See page C-144, Resumption of Transient Testing Program – point estimate of $177,612,122. The range shown in Table 1 covers the uncertainty of -20% to +35% which applies to all but actual costs from FY-11 to FY-13 {($177,612,122 - $5,899,691) - 20% +35% + $5,899,691 which gives range of $143M to $238M}.
Science Program Re-Establishment	See page C-13, Science Program – point estimate of $11,917,957. The range shown in Table 1 covers the uncertainty of -20% to +35% which gives range of $10M to $16M.	See page C-145, Science Program – point estimate of $30,012,204. The range shown in Table 1 covers the uncertainty of -20% to +35% which gives range of $24M to $41M.
Life-Cycle Operations	See page C-12 for point estimate of $588,404,667 less Scientific Coordinator point estimate of $39,284,706 for Life-Cycle Operations of $549,119,961. The range shown in Table 2 covers the uncertainty of -20% to +35% ($439M to $741M). The estimate includes 6 months of operation per year to conduct an average of 10 transient experiments per year. This basis was selected to provide a like-for-like comparison with ACRR. When not performing transient experiments, TREAT would support other INL missions.	See page C-145 for point estimate of $525,557,964 less Scientific Coordinator point estimate of $39,284,706 for Life Cycle Operations of $486,273,258. The range shown in Table 1 covers the uncertainty of -20% to +35% ($389M to $656M). The estimate includes 5 months of operation per year to conduct an average of 10 transient experiments per year. The SME's concurred that the ACRR throughput is slightly higher than TREAT. This basis was selected to provide a like-for-like comparison with TREAT. When not performing transient experiments, ACRR is used to support other SNL missions.
Science	See page C-13, Science Program	See page C-146, Science Program

Activity	Source Material for TREAT Cost Estimate	Source Material for ACRR Cost Estimate
Program Integration	– point estimate of $39,284,706. The range shown in Table 1 covers the uncertainty of -20% to +35% ($31M to $53M).	– point estimate of $39,284,706. The range shown in Table 1 covers the uncertainty of -20% to +35% ($31M to $53M).
Life Cycle Cost	Total of the Above	Total of the Above
Management Reserve (in footnote to table)	Calculation of TREAT management reserve is based on a high-level risk analysis presented in Appendix E, Table E-1. Includes major contributors from the risk register. The upper bound of TREAT MR is $14.4M. This is approximately 25.7% of the TREAT point estimate ($14.4M/$56M * 100% = 25.7%).	ACRR MR is based on TREAT management reserve. Scaled using the SME comparative analysis of TREAT –vs– ACRR. The upper bound of TREAT MR is 25.7% of the RTTP Cost for TREAT. This is multiplied by 0.76/0.85 to obtain the ACRR MR percentage of 23.0%. ACRR MR is $40.9 M = 23.0% * $178M (ACRR RTTP point estimate). See Appendix E, Table E-1.
DOE-Held Contingency (in footnote to table)	Calculation of TREAT DOE-held contingency is based on a high-level risk analysis of external program risks. A summary of the specific risks included in the contingency is presented in Appendix E, Table E-2. The upper bound of TREAT DOE-Held Contingency is $6.5M. This is approximately 9% of the TREAT RTTP point estimate ($6.5M/$56M * 100% = 11.6%).	Based on TREAT DOE-held contingency. Scaled using the SME comparative analysis of cost risk of TREAT as compared to ACRR. The upper bound of TREAT MR is 11.6% of TREAT RTTP point estimate. This is multiplied by 0.76/0.85 to obtain the ACRR DOE-Held Contingency of 10.4%. ACRR DOE-Held Contingency is $18.4M = 10.4% * $178M (the sum of new construction and mission operations support).

Table C-2. Source of cost estimate numbers presented in Table 3 in the main body of this report.

Activity	Source Material for TREAT Cost Estimate
RTTP Bounding Estimate	See page C-7, Resumption of Transient Testing Program - point estimate of $56,401,230. The range shown in Table 3 covers the uncertainty of -20% to +35% which applies to all but actual costs from FY-11 to FY-13 {($56,401,230 - $5,899,691) -20%/+35% + $5,899,691 which gives range of $46M to $74M.}
Science Program	See page C-13, Science Program – point estimate of $11,917,957. The range shown in Table 3 covers the uncertainty of -20% to +35% which gives range of $10M to $15M.
Total Program Cost	Total of the two items above.

The following pages of this appendix present the detailed cost estimate for TREAT and ACRR.

INTEROFFICE MEMORANDUM

Idaho National Laboratory INL

Date: November 7, 2013

To: L. O. Nelson, Project Engineer

From: A.W. Miller, Cost Estimator

Subject: Resume Transient Testing (RTT) Program – Transient Reactor Experiment and Test (TREAT) Facility /Annular Core Research Reactor (ACRR) New Hot Cell

Reference: 1C40-G3 Resume Transient Testing Program

Per your request, Cost Estimating prepared a cost estimate (Class 5) for the RTT Program – TREAT and a cost estimate (Preliminary Class 5) for the ACRR New Hot Cell Building. The estimated costs, including escalation and management reserve, are shown below.

• RTT Program - TREAT – Low Range	$530,000,000
• Class 5 point value	$657,000,000
• RTT Program - TREAT – High Range	$887,000,000
• ACRR New Hot Cell Building – Low Range	$590,000,000
• Preliminary Class 5 point value	$733,000,000
• ACRR New Hot Cell Building – High Range	$990,000,000

Please note the following:

A. Please refer to the original recapitulation and letter 1C40-G3.
B. Changes to this cost estimate from the original estimated cost include the following:
   1. Changes to the Work Breakdown Structure, which moved activities to different control accounts with no cost or resource changes.
   2. TREAT Base Operation and Infrastructure have been removed from the RTT Program estimate per the project team.
   3. Actuals for project management were added to the ACRR estimate.
C. Per the requester, this work will be direct funded. General and Administrative (G&A) costs are included in this estimate.
D. This cost estimate has been evaluated as a Class 5 estimate for the RTT Program and a Preliminary Class 5 for the ACRR cost estimate. The primary characteristic used in this guideline to define the classification category is the degree of project definition at this time. The intent of this classification is to assist in the interpretation of the quality and value of the information available to prepare this cost estimate and the expected accuracy levels that can be produced. Class 5 indicates the lowest amount of project information quality and value with a graded approach to a Class 1, which indicates the highest amount of project information quality and value.

E. Multiple reviews of the cost estimate were held with the project team and this cost estimator. Review dates include March 12, 13, and April 16, 2013. These reviews allowed for the program team to review and comment, in detail, on the perceived scope, basis of estimate, assumptions, project risks, and the resources that make up this cost estimate. Comments from this review have been incorporated into this estimate to reflect a project team consensus of this document.
F. Due to the preliminary nature of this estimate, the scope has not been evaluated by Idaho National Laboratory (INL) Construction Management to receive a "Block 9" determination in the INL Construction Commercial Practices Evaluation for the purpose of construction scope, management, and field oversight.

Refer to the cost estimating summary, detail, and markup sheets with the cost breakdowns.

This estimate, the work, and the work breakdown structure are based on the information provided to this estimator as to the scope of work to be completed. Any changes to the methodology used to prepare this estimate could have a significant effect on the cost estimate and/or schedule and should be reviewed by me. If you have any questions or comments, do not hesitate to contact me at 526-1827 or e-mail Andrew.Miller@inl.com.

Attachments

cc: D. S. Vandel, MS 3730
Estimate File 1C40-K

Uniform File Code: 8309
Disposition Authority: A16-1.5-b
Retention Schedule: Cut off at the end of each fiscal year. Destroy 10 years after cutoff.

NOTE: Original disposition authority, retention schedule, and Uniform Filing Code applied by the sender may not be appropriate for all recipients. Make adjustments as needed.

Summary Report

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Project Number: ***1C40-K***

ESTIMATE ELEMENT	Estimate Subtotal	Escalation	Management Reserve	TOTAL
		13.05%	*7.09%*	
Total Estimated Cost (TEC)	$937,939	$122,401	$75,167	$1,135,507
		103.26%	*1.72%*	
Other Project Cost (OPC)	$317,090,720	$327,438,049	$11,059,578	$655,588,347
		103.00%	*1.72%*	
Total Cost	$318,028,659	$327,560,450	$11,134,745	$656,723,854
Rounded Total Cost (Rounded to the nearest $ 1000000)				$657,000,000

C-6

		Remarks
Type of Estimate:	Class 5	
Estimator:	A. W. Miller	
Checked By:	SNW for Ross Allen	
Approved By:		

Project Summary Report

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Level	Group	Description	Estimate Subtotal	Escalation	Management Reserve MR	MR %	TOTAL
		TREAT Operations & Intergration	**$318,028,659**	**$327,560,450**	**$11,134,745**	**1.72%**	**$656,723,854**
		. . . . Resumption of Transient Testing Program	**$47,569,067**	**$5,480,797**	**$3,351,366**	**6.32%**	**$56,401,230**
CR.10.16.01	OPC	**. . . . . Actuals From FY11 to FY13 and Projected work in 2013**	**$5,899,691**	**$0**	**$0**	**0.00%**	**$5,899,691**
		. . . . . Management and Integration	**$4,018,276**	**$524,385**	**$336,659**	**7.41%**	**$4,879,320**
CR.10.16.02		. . . . . Project Management	$4,018,276	$524,385	$336,659	7.41%	$4,879,320
CR.10.16.02.01	**OPC**	. . . . . *Project Management A - OPC*	*$3,067,740*	*$400,340*	*$255,660*	*7.37%*	*$3,723,740*
CR.10.16.02.01		. . . . . *Project Management B - CAP*	*$266,760*	*$34,812*	*$22,231*	*7.37%*	*$323,803*
CR.10.16.02.02	**OPC**	. . . . . *Project Controls A - OPC*	*$440,606*	*$57,499*	*$38,021*	*7.63%*	*$536,127*
CR.10.16.02.02		. . . . . *Project Controls B -CAP*	*$38,314*	*$5,000*	*$3,306*	*7.63%*	*$46,620*
CR.10.16.02.03	**OPC**	. . . . . *Project Closeout*	*$204,856*	*$26,734*	*$17,440*	*7.53%*	*$249,030*
		. . . . . Program Documentation and Analysis	**$738,350**	**$96,355**	**$135,324**	**16.21%**	**$970,029**
CR.10.16.02.03.05	**OPC**	. . . . . Refurbishment and Replacement Plan (BEA)	$738,350	$96,355	$135,324	16.21%	$970,029
TTR0013	**OPC**	. . . . . *Seismic Assessment/Upgrades*	*$139,000*	*$18,140*	*$27,307*	*17.38%*	*$184,447*
01	**OPC**	. . . . . *Seismic Assessment*	*$139,000*	*$18,140*	*$27,307*	*17.38%*	*$184,447*
TTR0014	**OPC**	. . . . . *Refurbishments And Modifications*	*$599,350*	*$78,215*	*$108,017*	*15.94%*	*$785,582*
01	**OPC**	. . . . . *Preliminary Engineering Services*	*$36,400*	*$4,750*	*$3,148*	*7.65%*	*$44,298*
02	**OPC**	. . . . . *Drafting Services*	*$17,300*	*$2,258*	*$3,097*	*15.83%*	*$22,655*
03	**OPC**	. . . . . *Cost Estimating/Jury Review*	*$9,000*	*$1,175*	*$1,651*	*16.23%*	*$11,826*
04	**OPC**	. . . . . *Engineering Services*	*$40,300*	*$5,259*	*$7,612*	*16.71%*	*$53,172*
05	**OPC**	. . . . . *Drafting Services*	*$17,300*	*$2,258*	*$3,084*	*15.77%*	*$22,642*
06	**OPC**	. . . . . *Cost Estimating/Jury Review*	*$12,000*	*$1,566*	*$2,220*	*16.36%*	*$15,786*
07	**OPC**	. . . . . *Data Acquisition System (DAS)*	*$137,300*	*$17,918*	*$25,927*	*16.70%*	*$181,145*
001	**OPC**	. . . . . *Engineering and Design*	*$72,000*	*$9,396*	*$13,573*	*16.68%*	*$94,969*
002	**OPC**	. . . . . *Drawings and Documentation*	*$65,300*	*$8,522*	*$12,354*	*16.74%*	*$86,176*
007	**OPC**	. . . . . *Construction Supervision and Engineering*	*$242,750*	*$31,679*	*$44,704*	*16.29%*	*$319,133*

BEA

Project Summary Report

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Level	Group	Description	Estimate Subtotal	Escalation	Management Reserve MR	MR %	TOTAL
008	**OPC**	*..... Operations Support for Construction*	*$67,500*	*$8,809*	*$12,795*	*16.77%*	*$89,103*
009	**OPC**	*..... A-E Oversight Of Construction*	*$19,500*	*$2,545*	*$3,778*	*17.14%*	*$25,823*
		..... Reactor System Analysis	**$1,640,177**	**$214,043**	**$139,839**	**7.54%**	**$1,994,059**
CR.10.16.02.03.06	**OPC**	..... Refurbishment Planning and Execution A - OPC	$1,508,963	$196,920	$128,651	7.54%	$1,834,534
CR.10.16.02.03.06		..... Refurbishment Planning and Execution B - CAP	$131,214	$17,123	$11,187	7.54%	$159,525
		..... Reactor System Refurbishments and Replacements	**$12,927,829**	**$1,687,082**	**$2,175,086**	**14.88%**	**$16,789,997**
CR.10.16.04.01	**OPC**	..... Reactor Trip Systems (RTS)	$157,540	$20,559	$13,183	7.40%	$191,282
TTR0015	**OPC**	*..... Procure and Install High Voltage Power Supplies*	*$157,540*	*$20,559*	*$13,183*	*7.40%*	*$191,282*
CR.10.16.04.02	**OPC**	..... Reactor Control System (RCS)	$6,553,939	$855,289	$1,035,387	13.97%	$8,444,615
TTR0016	**OPC**	*..... Design New ARCS*	*$2,096,050*	*$273,535*	*$384,937*	*16.24%*	*$2,754,521*
001	**OPC**	*..... New ARCS*	*$1,331,100*	*$173,709*	*$244,824*	*16.27%*	*$1,749,633*
002	**OPC**	*..... Dedicated Microprocessor Testor (DMT) (NEW)*	*$764,950*	*$99,826*	*$140,112*	*16.20%*	*$1,004,888*
TTR0017	**OPC**	*..... Design New Manual Reactor Control System (MRCS)*	*$1,185,600*	*$154,721*	*$218,210*	*16.28%*	*$1,558,531*
TTR0018	**OPC**	*..... Procure and Install New Reactor Control System*	*$1,079,900*	*$140,927*	*$197,990*	*16.22%*	*$1,418,817*
TTR0019	**OPC**	*..... Program New Reactor Control System*	*$287,500*	*$37,519*	*$54,408*	*16.74%*	*$379,427*
TTR0020	**OPC**	*..... Drawings and Documentation*	*$337,200*	*$44,005*	*$63,280*	*16.60%*	*$444,485*
TTR0021	**OPC**	*..... Fiber Optic Cable & Power Cable*	*$1,567,689*	*$204,583*	*$116,562*	*6.58%*	*$1,888,834*
CR.10.16.04.05	**OPC**	..... Data Acquisition System (DAS)	$1,972,000	$257,346	$363,691	16.31%	$2,593,037
TTR0031	**OPC**	*..... DAS Hardware*	*$1,077,200*	*$140,575*	*$198,504*	*16.30%*	*$1,416,279*
TTR0032	**OPC**	*..... Program and Test New DAS*	*$894,800*	*$116,771*	*$165,187*	*16.33%*	*$1,176,758*
CR.10.16.04.07	**OPC**	..... Remote Control Room	$2,368,846	$309,134	$442,246	16.51%	$3,120,227
TTR0036	**OPC**	*..... Control Room Facilities and Remaining Office Space*	*$1,143,026*	*$149,165*	*$211,298*	*16.35%*	*$1,503,489*

Project Summary Report

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Level	Group	Description	Estimate Subtotal	Escalation	Management Reserve MR	MR %	TOTAL
TTR0037	**OPC**	*. . . . . Control Room Panels, Displays and Controls*	*$955,860*	*$124,740*	*$180,625*	*16.72%*	*$1,261,225*
TTR0038	**OPC**	*. . . . . Miscellaneous Cost To Relocate Control Room*	*$269,960*	*$35,230*	*$50,323*	*16.49%*	*$355,513*
TTR0041	**OPC**	. . . . . TREAT Operation and Maintenance	$904,104	$117,986	$140,361	13.73%	$1,162,450
001	**OPC**	*. . . . . Replacement Allowance for Obsolete Parts*	*$343,465*	*$44,822*	*$64,645*	*16.65%*	*$452,932*
002	**OPC**	*. . . . . Relocation / Supplies*	*$302,824*	*$39,519*	*$54,819*	*16.01%*	*$397,162*
003	**OPC**	*. . . . . TREAT Radiation Monitoring System Main OPS*	*$257,815*	*$33,645*	*$20,897*	*7.17%*	*$312,356*
CR.10.16.02.04	**OPC**	. . . . . ESH&Q	$971,400	$126,768	$180,218	16.41%	$1,278,386
TTR0001	**OPC**	*. . . . . Quality Assurance - Refurbishments and Upgrades A - OPC*	*$475,769*	*$62,088*	*$87,436*	*16.26%*	*$625,292*
TTR0001		*. . . . . Quality Assurance - Refurbishments and Upgrades B - CAP*	*$41,371*	*$5,399*	*$7,603*	*16.26%*	*$54,373*
TTR0002	**OPC**	*. . . . . Enviromental Safety and Health Engineering A - OPC*	*$265,512*	*$34,649*	*$49,628*	*16.53%*	*$349,789*
TTR0002		*. . . . . Enviromental Safety and Health Engineering B - CAP*	*$23,088*	*$3,013*	*$4,315*	*16.53%*	*$30,416*
TTR0003	**OPC**	*. . . . . Radiological Controls A - OPC*	*$143,134*	*$18,679*	*$26,989*	*16.68%*	*$188,801*
TTR0003		*. . . . . Radiological Controls B - CAP*	*$22,526*	*$2,940*	*$4,247*	*16.68%*	*$29,714*
		. . . . . Nuclear Safety Documentation and Analysis	**$3,029,690**	**$395,375**	**$564,459**	**16.48%**	**$3,989,524**
CR.10.16.02.03.02	**OPC**	. . . . . Documented Safety Analysis	$2,740,030	$357,574	$510,887	16.49%	$3,608,491
TTR0006	**OPC**	*. . . . . Documented Safety Analysis (DSA) Planning Document*	*$65,600*	*$8,561*	*$12,385*	*16.70%*	*$86,546*
TTR0007	**OPC**	*. . . . . DSA*	*$1,352,130*	*$176,453*	*$253,703*	*16.60%*	*$1,782,286*
01	**OPC**	*. . . . . Revise Existing SAR Chapters*	*$782,230*	*$102,081*	*$148,564*	*16.80%*	*$1,032,875*
02	**OPC**	*. . . . . Recalculate Dose Consequences*	*$131,200*	*$17,122*	*$24,223*	*16.33%*	*$172,544*
03	**OPC**	*. . . . . Implementation of New DSA and New TSR*	*$102,500*	*$13,376*	*$18,525*	*15.99%*	*$134,401*
04	**OPC**	*. . . . . Analysis of Steady State Power*	*$147,600*	*$19,262*	*$27,640*	*16.56%*	*$194,502*
05	**OPC**	*. . . . . Development of Engineering and Calc. Analysis Report*	*$73,800*	*$9,631*	*$13,385*	*16.04%*	*$96,816*

Project Summary Report

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Level	Group	Description	Estimate Subtotal	Escalation	Management Reserve MR	MR %	TOTAL
06	**OPC**	*. . . . . Hazard Assessment*	*$49,200*	*$6,421*	*$9,203*	*16.55%*	*$64,824*
07	**OPC**	*. . . . . Confirmation and Documentation of SCRAM System*	*$32,800*	*$4,280*	*$5,970*	*16.10%*	*$43,050*
08	**OPC**	*. . . . . Confirmation and Documentation of Transient Rod*	*$32,800*	*$4,280*	*$6,192*	*16.70%*	*$43,273*
TTR0008	**OPC**	*. . . . . DSA Code Validation*	*$393,600*	*$51,365*	*$70,787*	*15.91%*	*$515,752*
TTR0009	**OPC**	*. . . . . Technical Safety Requirements*	*$272,700*	*$35,587*	*$50,600*	*16.41%*	*$358,887*
TTR0010	**OPC**	*. . . . . Experiment Safety Analysis (ESA)*	*$656,000*	*$85,608*	*$123,412*	*16.64%*	*$865,020*
CR.10.16.02.03.03	**OPC**	. . . . . Fire Hazard Analysis	$289,660	$37,801	$53,573	16.36%	$381,033
TTR0011	**OPC**	*. . . . . Fire Hazard Analysis (FHA)*	*$289,660*	*$37,801*	*$53,573*	*16.36%*	*$381,033*
		. . . . . Resumption of Reactor Operations	**$9,421,052**	**$1,229,447**	**$0**	**0.00%**	**$10,650,499**
001	**OPC**	. . . . . 2014 Develop TREAT Reactor Ops/Maintenance Training Program	$733,884	$95,772	$0	0.00%	$829,656
01	**OPC**	*. . . . . TREAT Operations*	*$589,325*	*$76,907*	*$0*	*0.00%*	*$666,232*
02	**OPC**	*. . . . . TREAT Maintenance (CM, PM, Deffered)*	*$144,559*	*$18,865*	*$0*	*0.00%*	*$163,424*
002	**OPC**	. . . . . 2015 Re-Establish TREAT Reactor Ops/Maintenance Training Program to Support Refurb and Replacement	$733,884	$95,772	$0	0.00%	$829,656
01	**OPC**	*. . . . . TREAT Operations*	*$589,325*	*$76,907*	*$0*	*0.00%*	*$666,232*
02	**OPC**	*. . . . . TREAT Maintenance (CM, PM, Deffered)*	*$144,559*	*$18,865*	*$0*	*0.00%*	*$163,424*
003	**OPC**	. . . . . 2016 Re-Establish TREAT Reactor Ops/Maintenance Training Program to Support Refurb and Replacement	$1,834,710	$239,430	$0	0.00%	$2,074,140
01	**OPC**	*. . . . . TREAT Operations*	*$1,473,314*	*$192,267*	*$0*	*0.00%*	*$1,665,581*
02	**OPC**	*. . . . . TREAT Maintenance (CM, PM, Deffered)*	*$361,397*	*$47,162*	*$0*	*0.00%*	*$408,559*
004	**OPC**	. . . . . 2017 Re-Establish TREAT Reactor Ops/Maintenance Training Program to Support Reactor Ops	$2,935,537	$383,088	$0	0.00%	$3,318,624
01	**OPC**	*. . . . . TREAT Operations*	*$2,357,302*	*$307,628*	*$0*	*0.00%*	*$2,664,930*
02	**OPC**	*. . . . . TREAT Maintenance (CM, PM, Deffered)*	*$578,235*	*$75,460*	*$0*	*0.00%*	*$653,694*
005	**OPC**	. . . . . 2018 Readiness Review Support	$2,935,537	$383,088	$0	0.00%	$3,318,624

Project Summary Report

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Level	Group	Description	Estimate Subtotal	Escalation	Management Reserve MR	MR %	TOTAL
01	**OPC**	*. . . . . Contractor Readiness Preparation and Execution*	*$2,357,302*	*$307,628*	*$0*	*0.00%*	*$2,664,930*
02	**OPC**	*. . . . . DOE Readiness Review Support*	*$578,235*	*$75,460*	*$0*	*0.00%*	*$653,694*
CR.10.16.05		. . . . . Apply BEA Material G&A	$247,499	$32,299	$0	0.00%	$279,798
		. . . . . Mission Operations Support	**$9,173,552**	**$1,197,149**	**$0**	**0.00%**	**$10,370,701**
001	**OPC**	. . . . . 2014 Update Operating Facility Documentation	$733,884	$95,772	$0	0.00%	$829,656
01	**OPC**	*. . . . . TREAT Operations*	*$589,325*	*$76,907*	*$0*	*0.00%*	*$666,232*
02	**OPC**	*. . . . . TREAT Maintenance (CM, PM, Deffered)*	*$144,559*	*$18,865*	*$0*	*0.00%*	*$163,424*
002	**OPC**	. . . . . 2015 Support for Facility System Assessment and Documentation Updates	$733,884	$95,772	$0	0.00%	$829,656
01	**OPC**	*. . . . . TREAT Operations*	*$589,325*	*$76,907*	*$0*	*0.00%*	*$666,232*
02	**OPC**	*. . . . . TREAT Maintenance (CM, PM, Deffered)*	*$144,559*	*$18,865*	*$0*	*0.00%*	*$163,424*
003	**OPC**	. . . . . 2016 Operation Support for Refurbishments and Replacements	$1,834,710	$239,430	$0	0.00%	$2,074,140
01	**OPC**	*. . . . . TREAT Operations*	*$1,473,314*	*$192,267*	*$0*	*0.00%*	*$1,665,581*
02	**OPC**	*. . . . . TREAT Maintenance (CM, PM, Deffered)*	*$361,397*	*$47,162*	*$0*	*0.00%*	*$408,559*
004	**OPC**	. . . . . 2017 Operation Support for Refurbishments and Replacements	$2,935,537	$383,088	$0	0.00%	$3,318,624
01	**OPC**	*. . . . . TREAT Operations*	*$2,357,302*	*$307,628*	*$0*	*0.00%*	*$2,664,930*
02	**OPC**	*. . . . . TREAT Maintenance (CM, PM, Deffered)*	*$578,235*	*$75,460*	*$0*	*0.00%*	*$653,694*
005	**OPC**	. . . . . 2018 Operations Support for Reactor Startup	$2,935,537	$383,088	$0	0.00%	$3,318,624
01	**OPC**	*. . . . . TREAT Operations*	*$2,357,302*	*$307,628*	*$0*	*0.00%*	*$2,664,930*
02	**OPC**	*. . . . . TREAT Maintenance (CM, PM, Deffered)*	*$578,235*	*$75,460*	*$0*	*0.00%*	*$653,694*
CR.10.16.05	**OPC**	**. . . . . Apply BEA Material G&A**	**$680,180**	**$88,764**	**$0**	**0.00%**	**$768,944**
CR.10.17.03	**OPC**	**. . . . . Apply Subcontracts G&A**	**$40,269**	**$48,198**	**$0**	**0.00%**	**$88,468**
		. . . . Long Term TREAT Operations	**$260,895,082**	**$320,831,485**	**$6,678,100**	**1.15%**	**$588,404,667**
		. . . . . Surveillance and Maintenance During Long Term Operations	**$252,316,522**	**$300,957,434**	**$6,678,100**	**1.21%**	**$559,952,056**

Project Summary Report

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Level	Group	Description	Estimate Subtotal	Escalation	Management Reserve MR	MR %	TOTAL
CR.10.16.02		Project Management	$717,358	$93,615	$94,820	11.69%	$905,794
CR.10.16.02.01	**OPC**	*Project Management A - OPC*	*$67,640*	*$8,827*	*$11,690*	*15.29%*	*$88,157*
CR.10.16.02.01		*Project Management B - CAP*	*$67,640*	*$8,827*	*$11,690*	*15.29%*	*$88,157*
CR.10.16.02.01		*Project Management B - CAP*	*$67,716*	*$8,837*	*$5,643*	*7.37%*	*$82,196*
CR.10.16.02.02	**OPC**	*Project Controls A - OPC*	*$111,890*	*$14,602*	*$9,655*	*7.63%*	*$136,147*
CR.10.16.02.02		*Project Controls B -CAP*	*$9,730*	*$1,270*	*$840*	*7.63%*	*$11,839*
CR.10.16.02.03	**OPC**	*Project Closeout*	*$184,370*	*$24,060*	*$15,696*	*7.53%*	*$224,127*
CR.10.16.02.04	**OPC**	*ESH&Q*	*$276,012*	*$36,020*	*$51,296*	*16.44%*	*$363,328*
TTR0001	**OPC**	*Quality Assurance - Refurbishments and Upgrades A - OPC*	*$120,772*	*$15,761*	*$22,195*	*16.26%*	*$158,728*
TTR0001		*Quality Assurance - Refurbishments and Upgrades B - CAP*	*$10,502*	*$1,371*	*$1,930*	*16.26%*	*$13,802*
TTR0002	**OPC**	*Enviromental Safety and Health Engineering A - OPC*	*$67,399*	*$8,796*	*$12,598*	*16.53%*	*$88,793*
TTR0002		*Enviromental Safety and Health Engineering B - CAP*	*$5,861*	*$765*	*$1,095*	*16.53%*	*$7,721*
TTR0003	**OPC**	*Radiological Controls A - OPC*	*$65,760*	*$8,582*	*$12,399*	*16.68%*	*$86,741*
TTR0003		*Radiological Controls B - CAP*	*$5,718*	*$746*	*$1,078*	*16.68%*	*$7,543*
CR.10.16.02.03.01	**OPC**	Environmental Support (RCRA)	$169,200	$22,081	$19,128	10.00%	$210,409
CR.10.16.02.03.04	**OPC**	Security Documentation and Procedures	$88,884	$11,599	$16,701	16.62%	$117,184
TTR0012	**OPC**	*Security Documentation and Procedures*	*$88,884*	*$11,599*	*$16,701*	*16.62%*	*$117,184*
CR.10.17	**OPC**	Long Term Operations	$251,341,080	$300,830,139	$6,547,451	1.19%	$558,718,670
CR.10.17.01	**OPC**	*Long Term Operations*	*$236,439,512*	*$282,994,452*	*$0*	*0.00%*	*$519,433,964*
CR.10.17.01.01	**OPC**	*TREAT Annual Operations*	*$236,439,512*	*$282,994,452*	*$0*	*0.00%*	*$519,433,964*
CR.10.18.01	**OPC**	*Scientific Coordinator*	*$14,901,568*	*$17,835,687*	*$6,547,451*	*20.00%*	*$39,284,706*
	OPC	**D&D**	**$4,972,500**	**$15,557,958**	**$0**	**0.00%**	**$20,530,458**
	OPC	D&D	$4,972,500	$15,557,958	$0	0.00%	$20,530,458
CR.10.17.02	**OPC**	**Apply BEA Material G&A**	**$3,605,480**	**$4,315,399**	**$0**	**0.00%**	**$7,920,879**

Project Summary Report

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Level	Group	Description	Estimate Subtotal	Escalation	Management Reserve MR	MR %	TOTAL
CR.10.17.03	**OPC**	**..... Apply Subcontracts G&A**	**$580**	**$694**	**$0**	**0.00%**	**$1,274**
		.... Science Program	**$9,564,510**	**$1,248,169**	**$1,105,279**	**10.22%**	**$11,917,957**
CR.10.16.04.03	**OPC**	**..... TREAT Research Equipment Refurbished**	**$1,200,520**	**$156,668**	**$99,178**	**7.31%**	**$1,456,366**
TTR0022	**OPC**	..... Design Loop Control Module (LCM) System	$1,200,520	$156,668	$99,178	7.31%	$1,456,366
001	**OPC**	..... *Design Loop Control Module System*	*$467,100*	*$60,957*	*$39,260*	*7.43%*	*$567,317*
002	**OPC**	..... *Drawings and Documentation*	*$215,000*	*$28,058*	*$18,313*	*7.53%*	*$261,370*
003	**OPC**	..... *Procurement*	*$68,600*	*$8,952*	*$5,492*	*7.08%*	*$83,044*
004	**OPC**	..... *Installation and Testing*	*$440,220*	*$57,449*	*$35,309*	*7.09%*	*$532,978*
005	**OPC**	..... *Work Package Planning*	*$9,600*	*$1,253*	*$803*	*7.40%*	*$11,656*
CR.10.16.04.04	**OPC**	**..... Refurbishment**	**$5,083,294**	**$663,370**	**$439,366**	**7.65%**	**$6,186,029**
TTR0023	**OPC**	..... Hodoscope Design Engineering	$2,050,400	$267,577	$176,166	7.60%	$2,494,143
TTR0024	**OPC**	..... Specifications for Procurement	$2,270,700	$296,326	$198,469	7.73%	$2,765,495
TTR0025	**OPC**	..... Replace Photo-Multiplier Detectors	$266,394	$34,764	$22,563	7.49%	$323,721
TTR0026	**OPC**	..... Detector Functional Tests	$7,600	$992	$631	7.35%	$9,223
TTR0027	**OPC**	..... Platform and Source Positioning Tests	$11,400	$1,488	$993	7.70%	$13,880
TTR0028	**OPC**	..... Refurbishment of Detectors	$68,400	$8,926	$5,682	7.35%	$83,009
TTR0029	**OPC**	..... Revise Drawings and Specifications	$394,000	$51,417	$33,657	7.56%	$479,074
TTR0030	**OPC**	..... Work Package Planning	$14,400	$1,879	$1,205	7.40%	$17,484
CR.10.18.01	**OPC**	**..... Cross Cutting Baseline Transient Testing Capabilities**	**$3,245,296**	**$423,511**	**$566,735**	**15.45%**	**$4,235,542**
CR.10.18.01.01	**OPC**	..... Test Design	$1,382,600	$180,429	$145,580	9.31%	$1,708,609
TTR0071	**OPC**	..... *Experiment Safety Analysis*	*$1,077,600*	*$140,627*	*$90,268*	*7.41%*	*$1,308,494*
TTR0072	**OPC**	..... *Guide for Irradiation Experiments*	*$305,000*	*$39,803*	*$55,312*	*16.04%*	*$400,115*
CR.10.18.01.02	**OPC**	..... Scientific Coordinator	$1,862,696	$243,082	$421,156	20.00%	$2,526,933
CR.10.18.02	**OPC**	**..... Apply BEA Material G&A**	**$35,400**	**$4,620**	**$0**	**0.00%**	**$40,020**

Project Summary Report

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Level	Group	Description	Estimate Subtotal	Escalation	Management Reserve MR	MR %	TOTAL
Total	**RTT Program - TREAT**		**$318,028,659**	**$327,560,450**	**$11,134,745**	**1.72%**	**$656,723,854**

Estimate Markup Report

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

CONTRACTOR	MARK-UP PERCENT	LABOR & EQUIP HOURS	LABOR	MATERIAL	EQUIPMENT	OTHERS	SUBTOTAL	% MARKUP	% DIRECT COST	% TOTAL COST
ELECTRICAL CONTRACTOR - 016ELEC										
DIRECT COST			$184,300	$0	$25,000	$0	$209,300			
POD/Breaks/Mat'l Waste/Misc Supplies	10.00%		$18,430	$0	$2,500	$0	$20,930	10.00%		
bond	2.00%		$4,055	$0	$550	$0	$4,605	2.20%		
Profit	10.00%		$20,678	$0	$2,805	$0	$23,483	11.22%		
overhead	15.00%		$34,119	$0	$4,628	$0	$38,748	18.51%		
TOTAL FOR ELECTRICAL CONTRACTOR - 016ELEC		1,940	*$261,583*	*$0*	*$35,483*	*$0*	*$297,066*	41.93%	0.07%	0.03%
Battelle Energy Alliance - BEA										
DIRECT COST			$272,721,319	$42,533,896	$10,000	$1,270,000	$316,535,215			
	0.00%		$0	$0	$0	$0	$0	0.00%		
TOTAL FOR Battelle Energy Alliance - BEA		1,610,677	*$272,721,319*	*$42,533,896*	*$10,000*	*$1,270,000*	*$316,535,215*		99.67%	48.20%
General Subcontractor - GEN1										
DIRECT COST			$698,440	$5,878	$0	$138,600	$842,918			
POD/Breaks/Mat'l Waste/Misc Supplies	10.00%		$69,844	$588	$0	$13,860	$84,292	10.00%		
bond	2.00%		$15,366	$129	$0	$3,049	$18,544	2.20%		
Profit	10.00%		$78,365	$659	$0	$15,551	$94,575	11.22%		
overhead	15.00%		$129,302	$1,088	$0	$25,659	$156,049	18.51%		
TOTAL FOR General Subcontractor - GEN1		7,352	*$991,317*	*$8,342*	*$0*	*$196,719*	*$1,196,378*	41.93%	0.27%	0.13%

BEA

Report Settings Contractor Distribution Report

RTT Program - TREAT

NOTES:

1.) All features of SUCCESS are functional with this report.
2.) If Level Markups are used they should always be at the lowest level of the PWS Branch
3.) Detail line items should only be placed at the lowest level of a PWS Branch
4.) If a Level is collapsed then the detail will not be grouped nor reported. Completely expand the PWS to produce an accurate report
5.) If a level is distributed the amount will be added to the prime contractor amount
6.) Markup records must be percents and applied to all cost components
7.) The Other1,2,3 cost components are combined in the "Others" column.
8.) Reports are accurate to two decimal places (Productivity up to three decimal places).
9.) Multiple Prime Contractors may be used. The "Prime Contractor" totals will include all prime contractors' work, and the Prime Contractor Markups will be the aggregate markup of all prime contractors.
10.) Up to 10 contractor markups per contractor may be used. and must be percentages (not amounts).

Estimate Markup Report

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

CONTRACTOR	MARK-UP PERCENT	LABOR & EQUIP HOURS	LABOR	MATERIAL	EQUIPMENT	OTHERS	SUBTOTAL	% MARKUP	% DIRECT COST	% TOTAL COST
Direct Cost Subtotal		1,619,969	$273,604,059	$42,539,774	$35,000	$1,408,600	$317,587,433		100.00%	
Mark-Up Totals			$370,159	$2,465	$10,483	$58,119	$441,226			0.07%
Subtotal			$273,974,218	$42,542,239	$45,483	$1,466,719	$318,028,659			
Escalation	103.00%		$284,939,575	$42,402,205	$5,936	$212,735	$327,560,450			49.88%
Project Cost Subtotals			$558,913,793	$327,481,813	$258,218	$1,679,454	$645,589,109			
Management Reserve	1.72%		$10,249,403	$844,169	$4,502	$36,670	$11,134,745			1.70%
Total Cost w/ Markups RTT Program - TREAT			$569,163,196	$328,325,982	$262,720	$1,716,124	$656,723,854			

C-17

Labor Resource Report

Activity: **RTT Program - TREAT**
Group:
Level:
Project Name: RTT Program - TREAT

Project Location: MFC
Estimate Number: 1C40-K

Code	Description	WDC Year	Rate $/Hr	Hours	Direct Labor Cost
A14GB	ADMINISTRATIVE ASSIST/OFFICE COORDINATOR	FY-13-D	$64.32	**35,200**	$2,264,064
A20GB	OTHER ADMIN SUPPORT	FY-13-D	$67.92	**20,250**	$1,375,380
ADM	INL Admin, Doc. control		$65.00	**11,974**	$778,281
CFRM	INL Craft Forman		$100.00	**1,525**	$152,500
CM/CE	INL Construction Manager/Construction Engineer		$180.00	**750**	$135,000
CRAFT	INL Skilled Craft		$95.00	**15,851**	$1,505,845
CRITSA/ENG	INL Criticality Safety Officer/Engineering		$205.00	**350**	$71,750
CS	Modeling/Computer Systems		$195.00	**4,100**	$799,500
DE/ENG	INL Design Engineer		$195.00	**12,327**	$2,403,765
DE/ENG1	INL DESIGN ENGINEER		$180.00	**800**	$144,000
DRAFT	INL Drafter		$100.00	**4,940**	$494,000
E14C2	NUCLEAR/REACTOR ENGINEERING	FY-13-D	$211.67	**79,200**	$16,764,264
E14W4	NUCLEAR/REACTOR ENGINEERING	FY-13-D	$176.23	**17,600**	$3,101,648
E17Q5	QUALITY ENGINEERING	FY-13-D	$138.64	**17,600**	$2,440,064
E19H1	SAFETY ENGINEERING	FY-13-D	$151.78	**11,050**	$1,677,169
E48W1	OPERATIONS ENGINEER, GENERAL	FY-13-D	$128.09	**1,525**	$195,337
E54W4	OPS SYSTEM ENGR, VITAL SAFETY SYSTEMS	FY-13-D	$151.24	**212,950**	$32,206,558
E63W4	NUCLEAR SAFETY ANALYSIS	FY-13-D	$141.77	**4,500**	$637,965
ELEC1	ELECTRICIAN		$95.00	**170**	$16,150
ELECF	Electricain Forman		$95.00	**1,932**	$183,540
ENV/ENG	INL Environmental Engineer		$200.00	**846**	$169,200
ES&H	INL Environmental Safety and Health Eng.		$185.00	**1,956**	$361,860
EST	INL Cost Estimating		$150.00	**420**	$63,000

BEA

Labor Resource Report

Activity: **RTT Program - TREAT**
Group:
Level:
Project Name: RTT Program - TREAT

Project Location: MFC
Estimate Number: 1C40-K

Code	Description	WDC Year	Rate $/Hr	Hours	Direct Labor Cost
F-P/ENG	INL Fire Protection Engineer		$170.00	1,630	$277,100
F01GB	BUILDING/FACILITY MANAGEMENT	FY-13-D	$132.89	12,600	$1,674,414
F05GB	FAC OPERATIONS	FY-13-D	$137.57	105,600	$14,527,392
F10J1	WORK PLANNING AND/OR SCHEDULING	FY-13-D	$120.60	17,600	$2,122,560
F33P2	PM SCHEDULING	FY-13-D	$120.88	35,200	$4,254,976
F35P1	PROJECT MANAGER	FY-13-D	$188.53	35,200	$6,636,256
HP	INL Health Physics Tech		$90.00	1,179	$106,128
IT/TEC	INL IT Technician		$105.00	1,504	$157,920
NU/ENG	INL Analyst Engineer/Nuc/Rx		$205.00	27,380	$5,612,900
OPR/ENG	INL Operations Engineer		$180.00	200	$36,000
OPR/MGR	INL Operations Manager		$205.00	500	$102,500
P19GB	RECORDS MGMT/DOC CONTROL	FY-13-D	$111.20	9,000	$1,000,800
P23GB	TRAINING	FY-13-D	$111.30	30,900	$3,439,170
P44F2	PLANNING AND CONTROLS	FY-13-D	$99.49	2,250	$223,853
PCE	INL Project Controls Engineer		$105.00	2,152	$225,918
PCE1	Project Controls Engineer		$119.38	3,260	$389,227
PLANNER	INL Planner		$120.00	5,747	$689,688
PM/PE	INL Project manager/Project engineer		$205.00	14,786	$3,031,114
PROC	INL Procurement		$90.00	1,688	$151,920
QA/ENG	INL Quality Engineer		$130.00	4,010	$521,274
RAD/ENG	INL Radiation Engineer		$145.00	978	$141,810
RE/OPR	INL Reactor Operator		$120.00	1,500	$180,000
REA/SUP	INL Reactor Supervisor		$180.00	400	$72,000

Labor Resource Report

Activity: **RTT Program - TREAT**
Group:
Level:
Project Name: RTT Program - TREAT

Project Location: MFC
Estimate Number: 1C40-K

Code	Description	WDC Year	Rate $/Hr	Hours	Direct Labor Cost
S08H1	INDUSTRIAL HYGIENE	FY-13-D	$148.27	**8,800**	$1,304,776
SA/QA	INL Safety/Quality Engineer		$135.00	**20**	$2,700
SECURITY	INL Security Enginer		$165.00	**504**	$83,160
ST/ENG	INL Structrual Engineer		$200.00	**695**	$139,000
SUPER	INL Operator Supervisor		$135.00	**3,550**	$479,250
SYSENG	INL Systems Engineer		$180.00	**22,020**	$3,963,600
T03W1	DRAFTER	FY-13-D	$87.36	**4,500**	$393,120
T04J1	ELECTRO/MECH TECHNICIAN	FY-13-D	$107.33	**2,250**	$241,493
T05GB	EPRO	FY-13-D	$104.17	**9,000**	$937,530
T13H6	HEALTH PHYSICS TECH	FY-13-D	$108.76	**57,300**	$6,231,948
T44U1	NUCLEAR FACILITY OPERATOR	FY-13-D	$125.35	**352,000**	$44,123,200
TECH/EDIT	INL Tech Editor		$90.00	**3,560**	$320,400
U11GB	ELECTRICIAN	FY-13-D	$87.60	**2,250**	$197,100
U29GB	SYS MECHANIC	FY-13-D	$87.78	**2,250**	$197,505
U59M4	SECURITY OFFICER/ESCORT	FY-13-D	$70.61	**45**	$3,177
U71GB	EQUIPMENT OPER,HEAVY	FY-13-D	$87.44	**900**	$78,696
Z02GB	MANAGER, FAC SUPPORT SERVICES	FY-13-D	$173.22	**37,900**	$6,565,038
Z03GB	MANAGER, OPERATIONS	FY-13-D	$193.54	**128,145**	$24,801,183
Z04C2	MANAGER, SCI/ENG FUNCTION	FY-13-D	$275.11	**211,200**	$58,103,232
Total Labor Cost				**1,619,969**	**$261,681,868**

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.16.01 Actuals From FY11 to FY13 and Projected work in 2013												
Memo:	***This reflects actuals and projections from 2011- 2013, excluding NEPA and Facility Condition Assesment Plans.***											
	BEA	*U.C. per LS*					*5899691*	*0*	*0*	*0*	*0*	*5899691*
	Program Actuals to date for the Refurbishments		1.00	LS	0		$5,899,691	$0	$0	$0	$0	$5,899,691
Memo:	This cost represents FY11 to FY13 actual costs plus baseline, excluding the EA and facility evaluation plan portion of the estimate.											
	Subtotal						$5,899,691	$0	$0	$0	$0	$5,899,691
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$5,899,691**
	Escalation						$0	$0	$0	$0	$0	$0
	Management Reserve						$0	$0	$0	$0	$0	$0
---Total	**CR.10.16.01 Actuals From FY11 to FY13 and Projected work in 2013**				**0**		**$5,899,691**	**$0**	**$0**	**$0**	**$0**	**$5,899,691**
CR.10.16.02.01 Project Management A - OPC												
Memo:	***All TREAT refurbishment Costs are based on BEA estimate 1C40-C***											
	Labor hours for development of Project Execution Plans (PEP) are included in PM/PE hours.											
	BEA	*U.C. per YRS*			*1404*	*$205.00*	*287820*	*0*	*0*	*0*	*0*	*287820*
	Project manager		4.60	YRS	6,458	PM/PE	$1,323,972	$0	$0	$0	$0	$1,323,972
	BEA	*U.C. per YRS*			*1404*	*$205.00*	*287820*	*0*	*0*	*0*	*0*	*287820*
	Project engineer		4.60	YRS	6,458	PM/PE	$1,323,972	$0	$0	$0	$0	$1,323,972

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.16.02.01 Project Management A - OPC												
Memo:	***All TREAT refurbishment Costs are based on BEA estimate 1C40-C***											
	Labor hours for development of Project Execution Plans (PEP) are included in PM/PE hours.											
	BEA	*U.C. per YRS*			*1404*	*$65.00*	*91260*	*0*	*0*	*0*	*0*	*91260*
	INL Admin, Doc. control		4.60	YRS	6,458	ADM	$419,796	$0	$0	$0	$0	$419,796
	Subtotal						$3,067,740	$0	$0	$0	$0	$3,067,740
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$3,067,740**
	Escalation						$400,340	$0	$0	$0	$0	$400,340
	Management Reserve						$255,660	$0	$0	$0	$0	$255,660
---Total	**CR.10.16.02.01 Project Management A - OPC**				**19,375**		**$3,723,740**	**$0**	**$0**	**$0**	**$0**	**$3,723,740**

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Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.16.02.01 Project Management B - CAP												
Memo:	***All TREAT refurbishment Costs are based on BEA estimate 1C40-C***											
	Labor hours for development of Project Execution Plans (PEP) are included in PM/PE hours.											
	BEA	*U.C. per YRS*			*1404*	*$205.00*	*287820*	*0*	*0*	*0*	*0*	*287820*
	Project manager		0.40	YRS	562	PM/PE	$115,128	$0	$0	$0	$0	$115,128
	BEA	*U.C. per YRS*			*1404*	*$205.00*	*287820*	*0*	*0*	*0*	*0*	*287820*
	Project engineer		0.40	YRS	562	PM/PE	$115,128	$0	$0	$0	$0	$115,128

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.16.02.01 Project Management B - CAP												
Memo:	***All TREAT refurbishment Costs are based on BEA estimate 1C40-C***											
	Labor hours for development of Project Execution Plans (PEP) are included in PM/PE hours.											
	BEA	*U.C. per YRS*			*1404*	*$65.00*	*91260*	*0*	*0*	*0*	*0*	*91260*
	INL Admin, Doc. control		0.40	YRS	562	ADM	$36,504	$0	$0	$0	$0	$36,504
	Subtotal						$266,760	$0	$0	$0	$0	$266,760
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$266,760**
	Escalation						$34,812	$0	$0	$0	$0	$34,812
	Management Reserve						$22,231	$0	$0	$0	$0	$22,231
—Total	**CR.10.16.02.01 Project Management B - CAP**				**1,685**		**$323,803**	**$0**	**$0**	**$0**	**$0**	**$323,803**
CR.10.16.02.02 Project Controls A - OPC												
	BEA	*U.C. per LS*			*1716*	*$105.00*	*180180*	*0*	*0*	*0*	*0*	*180180*
	Project controls engineer		0.92	LS	1,579	PCE	$165,766	$0	$0	$0	$0	$165,766
	BEA	*U.C. per LS*			*1560*	*$120.00*	*187200*	*0*	*0*	*0*	*0*	*187200*
	Project scheduling		0.92	LS	1,435	PLANNER	$172,224	$0	$0	$0	$0	$172,224
	BEA	*U.C. per LS*			*1716*	*$65.00*	*111540*	*0*	*0*	*0*	*0*	*111540*
	Administrative records management		0.92	LS	1,579	ADM	$102,617	$0	$0	$0	$0	$102,617
	Subtotal						$440,606	$0	$0	$0	$0	$440,606
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$440,606**
	Escalation						$57,499	$0	$0	$0	$0	$57,499
	Management Reserve						$38,021	$0	$0	$0	$0	$38,021
—Total	**CR.10.16.02.02 Project Controls A - OPC**				**4,593**		**$536,127**	**$0**	**$0**	**$0**	**$0**	**$536,127**

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.16.02.02 Project Controls B -CAP													
		BEA	*U.C. per LS*			*1716*	*$105.00*	*180180*	*0*	*0*	*0*	*0*	*180180*
	Project controls engineer			0.08	LS	137	PCE	$14,414	$0	$0	$0	$0	$14,414
		BEA	*U.C. per LS*			*1560*	*$120.00*	*187200*	*0*	*0*	*0*	*0*	*187200*
	Project scheduling			0.08	LS	125	PLANNER	$14,976	$0	$0	$0	$0	$14,976
		BEA	*U.C. per LS*			*1716*	*$65.00*	*111540*	*0*	*0*	*0*	*0*	*111540*
	Administrative records management			0.08	LS	137	ADM	$8,923	$0	$0	$0	$0	$8,923
	Subtotal							$38,314	$0	$0	$0	$0	$38,314
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$38,314**
	Escalation							$5,000	$0	$0	$0	$0	$5,000
	Management Reserve							$3,306	$0	$0	$0	$0	$3,306
---Total	**CR.10.16.02.02 Project Controls B -CAP**					**399**		**$46,620**	**$0**	**$0**	**$0**	**$0**	**$46,620**
CR.10.16.02.03 Project Closeout													
		BEA	*U.C. per LS*			*1716*	*$119.38*	*204856.08*	*0*	*0*	*0*	*0*	*204856.08*
	Allowance for Project Manager Support Personnel			1.00	LS	1,716	PCE1	$204,856	$0	$0	$0	$0	$204,856
	Subtotal							$204,856	$0	$0	$0	$0	$204,856
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$204,856**
	Escalation							$26,734	$0	$0	$0	$0	$26,734
	Management Reserve							$17,440	$0	$0	$0	$0	$17,440
---Total	**CR.10.16.02.03 Project Closeout**					**1,716**		**$249,030**	**$0**	**$0**	**$0**	**$0**	**$249,030**

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 Seismic Assessment												
	BEA	*U.C. per LS*			*175*	*$200.00*	*35000*	*0*	*0*	*0*	*0*	*35000*
	Seismic Analysis		1.00	LS	175	ST/ENG	$35,000	$0	$0	$0	$0	$35,000
Memo: The estimate for the seismic analysis is consistent with information provided by Stevens & Associates, consulting engineers, who have performed several analyses of PC-2 and PC-3 facilities at MFC since 2002.												
	BEA	*U.C. per LS*			*500*	*$200.00*	*100000*	*0*	*0*	*0*	*0*	*100000*
	Review or generate new structural calculations		1.00	LS	500	ST/ENG	$100,000	$0	$0	$0	$0	$100,000
	BEA	*U.C. per LS*			*20*	*$200.00*	*4000*	*0*	*0*	*0*	*0*	*4000*
	Review of Seismic Analysis		1.00	LS	20	ST/ENG	$4,000	$0	$0	$0	$0	$4,000
	Subtotal						$139,000	$0	$0	$0	$0	$139,000
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$139,000**
	Escalation						$18,140	$0	$0	$0	$0	$18,140
	Management Reserve						$27,307	$0	$0	$0	$0	$27,307
---Total 01 Seismic Assessment					**695**		**$184,447**	**$0**	**$0**	**$0**	**$0**	**$184,447**
01 Preliminary Engineering Services												
	BEA	*U.C. per LS*			*120*	*$195.00*	*23400*	*0*	*0*	*0*	*0*	*23400*
	INL Design Engineer, Electrical		1.00	LS	120	DE/ENG	$23,400	$0	$0	$0	$0	$23,400
	BEA	*U.C. per LS*			*40*	*$195.00*	*7800*	*0*	*0*	*0*	*0*	*7800*
	INL Design Engineer, Mechanical		1.00	LS	40	DE/ENG	$7,800	$0	$0	$0	$0	$7,800
	BEA	*U.C. per LS*			*20*	*$195.00*	*3900*	*0*	*0*	*0*	*0*	*3900*
	INL Design Engineer, Telephone		1.00	LS	20	DE/ENG	$3,900	$0	$0	$0	$0	$3,900

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 Preliminary Engineering Services													
ADM		BEA	*U.C. per LS*			*20*	*$65.00*	*1300*	*0*	*0*	*0*	*0*	*1300*
	Design Admin support			1.00	LS	20	ADM	$1,300	$0	$0	$0	$0	$1,300
	Subtotal							$36,400	$0	$0	$0	$0	$36,400
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$36,400**
	Escalation							$4,750	$0	$0	$0	$0	$4,750
	Management Reserve							$3,148	$0	$0	$0	$0	$3,148
---Total 01 Preliminary Engineering Services						**200**		**$44,298**	**$0**	**$0**	**$0**	**$0**	**$44,298**
02 Drafting Services													
		BEA	*U.C. per LS*			*120*	*$100.00*	*12000*	*0*	*0*	*0*	*0*	*12000*
	Drafting			1.00	LS	120	DRAFT	$12,000	$0	$0	$0	$0	$12,000
		BEA	*U.C. per LS*			*40*	*$65.00*	*2600*	*0*	*0*	*0*	*0*	*2600*
	Administrative			1.00	LS	40	ADM	$2,600	$0	$0	$0	$0	$2,600
		BEA	*U.C. per LS*			*30*	*$90.00*	*2700*	*0*	*0*	*0*	*0*	*2700*
	INL Tech Editor			1.00	LS	30	TECH/EDIT	$2,700	$0	$0	$0	$0	$2,700
	Subtotal							$17,300	$0	$0	$0	$0	$17,300
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$17,300**
	Escalation							$2,258	$0	$0	$0	$0	$2,258
	Management Reserve							$3,097	$0	$0	$0	$0	$3,097
---Total 02 Drafting Services						**190**		**$22,655**	**$0**	**$0**	**$0**	**$0**	**$22,655**

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code / Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
03 Cost Estimating/Jury Review												
	BEA	*U.C. per LS*			*60*	*$150.00*	*9000*	*0*	*0*	*0*	*0*	*9000*
Cost Estimating support			1.00	LS	60	EST	$9,000	$0	$0	$0	$0	$9,000
Subtotal							$9,000	$0	$0	$0	$0	$9,000
Sales Tax							$0	$0	$0	$0	$0	$0
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$9,000**
Escalation							$1,175	$0	$0	$0	$0	$1,175
Management Reserve							$1,651	$0	$0	$0	$0	$1,651
---Total 03 Cost Estimating/Jury Review					**60**		**$11,826**	**$0**	**$0**	**$0**	**$0**	**$11,826**
04 Engineering Services												
	BEA	*U.C. per LS*			*120*	*$195.00*	*23400*	*0*	*0*	*0*	*0*	*23400*
INL Design Engineer, Electrical			1.00	LS	120	DE/ENG	$23,400	$0	$0	$0	$0	$23,400
	BEA	*U.C. per LS*			*60*	*$195.00*	*11700*	*0*	*0*	*0*	*0*	*11700*
INL Design Engineer, Mechanical			1.00	LS	60	DE/ENG	$11,700	$0	$0	$0	$0	$11,700
	BEA	*U.C. per LS*			*20*	*$195.00*	*3900*	*0*	*0*	*0*	*0*	*3900*
INL Design Engineer, Telephone			1.00	LS	20	DE/ENG	$3,900	$0	$0	$0	$0	$3,900

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
04 Engineering Services													
ADM		BEA	*U.C. per LS*			*20*	*$65.00*	*1300*	*0*	*0*	*0*	*0*	*1300*
	Design Admin support			1.00	LS	20	ADM	$1,300	$0	$0	$0	$0	$1,300
	Subtotal							$40,300	$0	$0	$0	$0	$40,300
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$40,300**
	Escalation							$5,259	$0	$0	$0	$0	$5,259
	Management Reserve							$7,612	$0	$0	$0	$0	$7,612
---Total 04 Engineering Services						**220**		**$53,172**	**$0**	**$0**	**$0**	**$0**	**$53,172**
05 Drafting Services													
		BEA	*U.C. per LS*			*120*	*$100.00*	*12000*	*0*	*0*	*0*	*0*	*12000*
	Drafting			1.00	LS	120	DRAFT	$12,000	$0	$0	$0	$0	$12,000
		BEA	*U.C. per LS*			*40*	*$65.00*	*2600*	*0*	*0*	*0*	*0*	*2600*
	Administrative			1.00	LS	40	ADM	$2,600	$0	$0	$0	$0	$2,600
		BEA	*U.C. per LS*			*30*	*$90.00*	*2700*	*0*	*0*	*0*	*0*	*2700*
	INL Tech Editor			1.00	LS	30	TECH/EDIT	$2,700	$0	$0	$0	$0	$2,700
	Subtotal							$17,300	$0	$0	$0	$0	$17,300
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$17,300**
	Escalation							$2,258	$0	$0	$0	$0	$2,258
	Management Reserve							$3,084	$0	$0	$0	$0	$3,084
---Total 05 Drafting Services						**190**		**$22,642**	**$0**	**$0**	**$0**	**$0**	**$22,642**

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
06 Cost Estimating/Jury Review												
		BEA U.C. per LS			*80*	*$150.00*	*12000*	*0*	*0*	*0*	*0*	*12000*
	Cost Estimating support		1.00	LS	80	EST	$12,000	$0	$0	$0	$0	$12,000
	Subtotal						$12,000	$0	$0	$0	$0	$12,000
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$12,000**
	Escalation						$1,566	$0	$0	$0	$0	$1,566
	Management Reserve						$2,220	$0	$0	$0	$0	$2,220
---Total	**06 Cost Estimating/Jury Review**				**80**		**$15,786**	**$0**	**$0**	**$0**	**$0**	**$15,786**
001 Engineering and Design												
		BEA U.C. per LS			*400*	*$180.00*	*72000*	*0*	*0*	*0*	*0*	*72000*
	Develop Functional Requirements Specification for DAS and EDPM (800+/-200hrA)		1.00	LS	400	SYSENG	$72,000	$0	$0	$0	$0	$72,000
	Memo: The following duplicated from the previous estimate: "The DAS will need be upgraded to a system with a minimum of 632 redundant channels. The existing analog front end hardware will be replaced. The analog tape system will be replaced with a redundant digital system. The display and communications capability will be upgraded with current technology."											
	Subtotal						$72,000	$0	$0	$0	$0	$72,000
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$72,000**
	Escalation						$9,396	$0	$0	$0	$0	$9,396
	Management Reserve						$13,573	$0	$0	$0	$0	$13,573
---Total	**001 Engineering and Design**				**400**		**$94,969**	**$0**	**$0**	**$0**	**$0**	**$94,969**
002 Drawings and Documentation												
		BEA U.C. per LS			*200*	*$180.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
	INL Design Engineer		1.00	LS	200	SYSENG	$36,000	$0	$0	$0	$0	$36,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
002 Drawings and Documentation													
		BEA	*U.C. per LS*			*190*	*$100.00*	*19000*	*0*	*0*	*0*	*0*	*19000*
	INL Drafter			1.00	LS	190	DRAFT	$19,000	$0	$0	$0	$0	$19,000
		BEA	*U.C. per LS*			*100*	*$90.00*	*9000*	*0*	*0*	*0*	*0*	*9000*
	INL Tech Editor			1.00	LS	100	TECH/EDIT	$9,000	$0	$0	$0	$0	$9,000
		BEA	*U.C. per LS*			*20*	*$65.00*	*1300*	*0*	*0*	*0*	*0*	*1300*
	INL Admin, Doc. control			1.00	LS	20	ADM	$1,300	$0	$0	$0	$0	$1,300
	Subtotal							$65,300	$0	$0	$0	$0	$65,300
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$65,300**
	Escalation							$8,522	$0	$0	$0	$0	$8,522
	Management Reserve							$12,354	$0	$0	$0	$0	$12,354
—Total	**002 Drawings and Documentation**					**510**		**$86,176**	**$0**	**$0**	**$0**	**$0**	**$86,176**
007 Construction Supervision and Engineering													
		BEA	*U.C. per EA*			*750*	*$180.00*	*135000*	*0*	*0*	*0*	*0*	*135000*
	INL Construction Manager/ Construction Engineer			1.00	EA	750	CM/CE	$135,000	$0	$0	$0	$0	$135,000
		BEA	*U.C. per EA*			*240*	*$150.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
	INL Cost Estimating, Additional Scope Change Orders			1.00	EA	240	EST	$36,000	$0	$0	$0	$0	$36,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
007 Construction Supervision and Engineering													
	BEA	U.C. per EA				*350*	*$205.00*	*71750*	*0*	*0*	*0*	*0*	*71750*
	Project Engineer		1.00	EA		350	CRITSA/EN	$71,750	$0	$0	$0	$0	$71,750
	Subtotal							$242,750	$0	$0	$0	$0	$242,750
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups	0.00%						$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$242,750**
	Escalation							$31,679	$0	$0	$0	$0	$31,679
	Management Reserve							$44,704	$0	$0	$0	$0	$44,704
---Total	**007 Construction Supervision and Engineering**					**1,340**		**$319,133**	**$0**	**$0**	**$0**	**$0**	**$319,133**
008 Operations Support for Construction													
	BEA	U.C. per EA				*500*	*$135.00*	*67500*	*0*	*0*	*0*	*0*	*67500*
	INL Operations Support for Construction1		1.00	EA		500	SUPER	$67,500	$0	$0	$0	$0	$67,500
	Subtotal							$67,500	$0	$0	$0	$0	$67,500
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups	0.00%						$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$67,500**
	Escalation							$8,809	$0	$0	$0	$0	$8,809
	Management Reserve							$12,795	$0	$0	$0	$0	$12,795
---Total	**008 Operations Support for Construction**					**500**		**$89,103**	**$0**	**$0**	**$0**	**$0**	**$89,103**
009 A-E Oversight Of Construction													
	BEA	U.C. per EA				*60*	*$195.00*	*11700*	*0*	*0*	*0*	*0*	*11700*
	INL Design Engineer, Electrical		1.00	EA		60	DE/ENG	$11,700	$0	$0	$0	$0	$11,700

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
009 A-E Oversight Of Construction													
	BEA	*U.C. per EA*				*40*	*$195.00*	*7800*	*0*	*0*	*0*	*0*	*7800*
	INL Design Engineer, Mechanical			1.00	EA	40	DE/ENG	$7,800	$0	$0	$0	$0	$7,800
	Subtotal							$19,500	$0	$0	$0	$0	$19,500
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$19,500**
	Escalation							$2,545	$0	$0	$0	$0	$2,545
	Management Reserve							$3,778	$0	$0	$0	$0	$3,778
---Total	**009 A-E Oversight Of Construction**					**100**		**$25,823**	**$0**	**$0**	**$0**	**$0**	**$25,823**

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CR.10.16.02.03.06 Refurbishment Planning and Execution A - OPC

Memo: ***40 % of these activities here in the portion.***

	BEA	*U.C. per EA*				*762*	*$195.00*	*148590*	*0*	*0*	*0*	*0*	*148590*
	Design Engineer, 1/2 time for 22 months			0.92	EA	701	DE/ENG	$136,703	$0	$0	$0	$0	$136,703
	BEA	*U.C. per EA*				*1525*	*$120.00*	*183000*	*0*	*0*	*0*	*0*	*183000*
	Planner full time for 22 months			0.92	EA	1,403	PLANNER	$168,360	$0	$0	$0	$0	$168,360
	BEA	*U.C. per EA*				*3050*	*$180.00*	*549000*	*0*	*0*	*0*	*0*	*549000*
	2 Systems Engineers full time for 22 months			0.92	EA	2,806	SYSENG	$505,080	$0	$0	$0	$0	$505,080
	BEA	*U.C. per EA*				*1525*	*$100.00*	*152500*	*0*	*0*	*0*	*0*	*152500*
	Craft Foreman full time for 22 months			0.92	EA	1,403	CFRM	$140,300	$0	$0	$0	$0	$140,300
	BEA	*U.C. per EA*				*1525*	*$135.00*	*205875*	*0*	*0*	*0*	*0*	*205875*
	Operations Supervisor full time for 22 months			1.84	EA	2,806	SUPER	$378,810	$0	$0	$0	$0	$378,810

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.16.02.03.06 Refurbishment Planning and Execution A - OPC													
Memo:	***40 % of these activities here in the portion.***												
E48W1	BEA	U.C. per EA				*1525*	*$128.09*	*195337.25*	*0*	*0*	*0*	*0*	*195337.25*
	OPERATIONS ENGINEER, GENERAL			0.92	EA	1,403	E48W1	$179,710	$0	$0	$0	$0	$179,710
	Subtotal							$1,508,963	$0	$0	$0	$0	$1,508,963
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$1,508,963**
	Escalation							$196,920	$0	$0	$0	$0	$196,920
	Management Reserve							$128,651	$0	$0	$0	$0	$128,651
---Total	**CR.10.16.02.03.06 Refurbishment Planning and Execution A - OPC**					**10,522**		**$1,834,534**	**$0**	**$0**	**$0**	**$0**	**$1,834,534**

CR.10.16.02.03.06 Refurbishment Planning and Execution B - CAP													
Memo:	***40 % of these activities here in the portion.***												
	BEA	U.C. per EA				*762*	*$195.00*	*148590*	*0*	*0*	*0*	*0*	*148590*
	Design Engineer, 1/2 time for 22 months			0.08	EA	61	DE/ENG	$11,887	$0	$0	$0	$0	$11,887
	BEA	U.C. per EA				*1525*	*$120.00*	*183000*	*0*	*0*	*0*	*0*	*183000*
	Planner full time for 22 months			0.08	EA	122	PLANNER	$14,640	$0	$0	$0	$0	$14,640
	BEA	U.C. per EA				*3050*	*$180.00*	*549000*	*0*	*0*	*0*	*0*	*549000*
	2 Systems Engineers full time for 22 months			0.08	EA	244	SYSENG	$43,920	$0	$0	$0	$0	$43,920
	BEA	U.C. per EA				*1525*	*$100.00*	*152500*	*0*	*0*	*0*	*0*	*152500*
	Craft Foreman full time for 22 months			0.08	EA	122	CFRM	$12,200	$0	$0	$0	$0	$12,200
	BEA	U.C. per EA				*1525*	*$135.00*	*205875*	*0*	*0*	*0*	*0*	*205875*
	Operations Supervisor full time for 22 months			0.16	EA	244	SUPER	$32,940	$0	$0	$0	$0	$32,940

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.16.02.03.06 Refurbishment Planning and Execution B - CAP													
Memo:	***40 % of these activities here in the portion.***												
E48W1	BEA	*U.C. per EA*				*1525*	*$128.09*	*195337.25*	*0*	*0*	*0*	*0*	*195337.25*
	OPERATIONS ENGINEER, GENERAL			0.08	EA	122	E48W1	$15,627	$0	$0	$0	$0	$15,627
	Subtotal							$131,214	$0	$0	$0	$0	$131,214
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$131,214**
	Escalation							$17,123	$0	$0	$0	$0	$17,123
	Management Reserve							$11,187	$0	$0	$0	$0	$11,187
---Total	**CR.10.16.02.03.06 Refurbishment Planning and Execution B - CAP**					**915**		**$159,525**	**$0**	**$0**	**$0**	**$0**	**$159,525**
TTR0015 Procure and Install High Voltage Power Supplies													
	BEA	*U.C. per LS*				*350*	*$180.00*	*63000*	*0*	*0*	*0*	*0*	*63000*
	Design Engineering			1.00	LS	350	SYSENG	$63,000	$0	$0	$0	$0	$63,000
	BEA	*U.C. per EA*		NJ12				*0*	*0*	*4500*	*0*	*0*	*4500*
	Allowance for BEA travel and vendors for inspection of proposed equipment			1.00	EA	0		$0	$0	$4,500	$0	$0	$4,500
Memo:	(Assume $1500 each for no more that 3 vendors)												
	BEA	*U.C. per EA*		NJ12				*0*	*0*	*1500*	*0*	*0*	*1500*
	Allowance for BEA travel to vendor for FAT witness testing			1.00	EA	0		$0	$0	$1,500	$0	$0	$1,500
Memo:	(Assume $1500 for the trip)												
	BEA	*U.C. per LS*				*40*	*$65.00*	*2600*	*0*	*0*	*0*	*0*	*2600*
	INL Admin, Doc. control			1.00	LS	40	ADM	$2,600	$0	$0	$0	$0	$2,600
	BEA	*U.C. per EA*		NM60		*300*	*$95.00*	*28500*	*0*	*38000*	*0*	*0*	*66500*
	High voltage power supplies			1.00	EA	300	CRAFT	$28,500	$0	$38,000	$0	$0	$66,500
	BEA	*U.C. per EA*				*100*	*$120.00*	*12000*	*0*	*0*	*0*	*0*	*12000*
	Treat operating instructions			1.00	EA	100	RE/OPR	$12,000	$0	$0	$0	$0	$12,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0015 Procure and Install High Voltage Power Supplies													
		BEA	*U.C. per LS*			*40*	*$120.00*	*4800*	*0*	*0*	*0*	*0*	*4800*
	INL Planner			1.00	LS	40	PLANNER	$4,800	$0	$0	$0	$0	$4,800
	Subtotal							$110,900	$0	$44,000	$0	$0	$154,900
	Sales Tax							$0	$0	$2,640	$0	$0	$2,640
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$157,540**
	Escalation							$14,472	$0	$6,087	$0	$0	$20,559
	Management Reserve							$9,280	$0	$3,903	$0	$0	$13,183
---Total	**TTR0015 Procure and Install High Voltage Power Supplies**					**830**		**$134,652**	**$0**	**$56,629**	**$0**	**$0**	**$191,281**

001 New ARCS

		BEA	*U.C. per EA*			*800*	*$180.00*	*144000*	*0*	*0*	*0*	*0*	*144000*
	Develop Functional Requirements Specification for ARCS			1.00	EA	800	SYSENG	$144,000	$0	$0	$0	$0	$144,000
		BEA	*U.C. per EA*			*600*	*$180.00*	*108000*	*0*	*0*	*0*	*0*	*108000*
	Design new ARCS - Conceptual design (Architecture, power, maintenance, testing)			1.00	EA	600	SYSENG	$108,000	$0	$0	$0	$0	$108,000
		BEA	*U.C. per EA*			*250*	*$180.00*	*45000*	*0*	*0*	*0*	*0*	*45000*
	Hardware Design (Selection of Hardware)			1.00	EA	250	SYSENG	$45,000	$0	$0	$0	$0	$45,000
		BEA	*U.C. per EA*			*1200*	*$180.00*	*216000*	*0*	*0*	*0*	*0*	*216000*
	Hardware design of cabinets/wiring			1.00	EA	1,200	SYSENG	$216,000	$0	$0	$0	$0	$216,000
		BEA	*U.C. per EA*			*200*	*$180.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
	Determination of hardware settings			1.00	EA	200	SYSENG	$36,000	$0	$0	$0	$0	$36,000
		BEA	*U.C. per EA*	NJ12				*0*	*0*	*4500*	*0*	*0*	*4500*
	Allowance for BEA travel to vendors for inspection of proposed equipment			1.00	EA	0		$0	$0	$4,500	$0	$0	$4,500

Memo: Assume $1500 each for no more than that 3 vendors

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
001 New ARCS												
	BEA	*U.C. per EA*	NJ12				*0*	*0*	*1500*	*0*	*0*	*1500*
	Allowance for BEA travel to vendor for FAT witness testing		1.00	EA	0		$0	$0	$1,500	$0	$0	$1,500
Memo:	Assume $1500 for the trip											
	BEA	*U.C. per EA*			*200*	*$180.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
	Procure and install new ARCS		1.00	EA	200	SYSENG	$36,000	$0	$0	$0	$0	$36,000
Memo:	Remove equipment from existing cabinet and install new equipment and wiring											
	BEA	*U.C. per EA*			*700*	*$95.00*	*66500*	*0*	*0*	*0*	*0*	*66500*
	Procure and install new ARCS		1.00	EA	700	CRAFT	$66,500	$0	$0	$0	$0	$66,500
	BEA	*U.C. per EA*			*600*	*$180.00*	*108000*	*0*	*0*	*0*	*0*	*108000*
	Develop Software Requirements Spec		1.00	EA	600	SYSENG	$108,000	$0	$0	$0	$0	$108,000
	BEA	*U.C. per EA*			*800*	*$180.00*	*144000*	*0*	*0*	*0*	*0*	*144000*
	Develop Software Detailed design		1.00	EA	800	SYSENG	$144,000	$0	$0	$0	$0	$144,000
	BEA	*U.C. per EA*			*400*	*$180.00*	*72000*	*0*	*0*	*0*	*0*	*72000*
	Program/DEBUG ARCS		1.00	EA	400	SYSENG	$72,000	$0	$0	$0	$0	$72,000
	BEA	*U.C. per EA*			*800*	*$180.00*	*144000*	*0*	*0*	*0*	*0*	*144000*
	Test Specification and procedures development		1.00	EA	800	SYSENG	$144,000	$0	$0	$0	$0	$144,000
	BEA	*U.C. per EA*			*400*	*$180.00*	*72000*	*0*	*0*	*0*	*0*	*72000*
	Engineering Supervision of Testing		1.00	EA	400	SYSENG	$72,000	$0	$0	$0	$0	$72,000
	BEA	*U.C. per EA*			*800*	*$95.00*	*76000*	*0*	*0*	*0*	*0*	*76000*
	Program and test new ARCS		1.00	EA	800	CRAFT	$76,000	$0	$0	$0	$0	$76,000
	BEA	*U.C. per EA*			*40*	*$180.00*	*7200*	*0*	*0*	*0*	*0*	*7200*
	V&V Software Test Plan		1.00	EA	40	SYSENG	$7,200	$0	$0	$0	$0	$7,200
	BEA	*U.C. per EA*			*120*	*$180.00*	*21600*	*0*	*0*	*0*	*0*	*21600*
	V&V Software Test Procedure		1.00	EA	120	SYSENG	$21,600	$0	$0	$0	$0	$21,600
	BEA	*U.C. per EA*			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	V&V Software Plan/Procedure review (Design Review)		1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code / Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
001 New ARCS												
	BEA	*U.C. per EA*			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
V&V Procedure Execution			1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400
Subtotal							$1,325,100	$0	$6,000	$0	$0	$1,331,100
Sales Tax							$0	$0	$0	$0	$0	$0
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$1,331,100**
Escalation							$172,926	$0	$783	$0	$0	$173,709
Management Reserve							$243,721	$0	$1,104	$0	$0	$244,824
---Total 001 New ARCS					**8,070**		**$1,741,746**	**$0**	**$7,887**	**$0**	**$0**	**$1,749,633**
002 Dedicated Microprocessor Testor (DMT) (NEW)												
Memo: ***Design new Dedicated Microprocessor Testor (DMT)***												
	BEA	*U.C. per EA*			*600*	*$180.00*	*108000*	*0*	*0*	*0*	*0*	*108000*
Develop DMT Functional Requirements			1.00	EA	600	SYSENG	$108,000	$0	$0	$0	$0	$108,000
	BEA	*U.C. per EA*			*200*	*$180.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
Selection of Hardware / Software			1.00	EA	200	SYSENG	$36,000	$0	$0	$0	$0	$36,000
	BEA	*U.C. per EA*			*250*	*$180.00*	*45000*	*0*	*0*	*0*	*0*	*45000*
DMT Cabinet Hardware design			1.00	EA	250	SYSENG	$45,000	$0	$0	$0	$0	$45,000
	BEA	*U.C. per EA*		NJ12			*0*	*0*	*4500*	*0*	*0*	*4500*
Allowance for BEA travel to vendors for inspection of proposed equipment			1.00	EA	0		$0	$0	$4,500	$0	$0	$4,500
Memo: Assume $1500 each for no more than that 3 vendors												
	BEA	*U.C. per EA*		NJ12			*0*	*0*	*1500*	*0*	*0*	*1500*
Allowance for BEA travel to vendor for FAT witness testing			1.00	EA	0		$0	$0	$1,500	$0	$0	$1,500
Memo: Assume $1500 for the trip												
	BEA	*U.C. per EA*		NM60	*200*	*$180.00*	*36000*	*0*	*60000*	*0*	*0*	*96000*
Procure and install updated DMT			1.00	EA	200	SYSENG	$36,000	$0	$60,000	$0	$0	$96,000

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
002 Dedicated Microprocessor Testor (DMT) (NEW)												
Memo:	***Design new Dedicated Microprocessor Testor (DMT)***											
		BEA U.C. per EA			*250*	*$95.00*	*23750*	*0*	*0*	*0*	*0*	*23750*
	Procure and install updated DMT		1.00	EA	250	CRAFT	$23,750	$0	$0	$0	$0	$23,750
		BEA U.C. per EA			*200*	*$180.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
	Develop software requirements spec		1.00	EA	200	SYSENG	$36,000	$0	$0	$0	$0	$36,000
Memo:	Program and test new DMT (Includes V&V)											
		BEA U.C. per EA			*600*	*$180.00*	*108000*	*0*	*0*	*0*	*0*	*108000*
	Develop software detailed design description		1.00	EA	600	SYSENG	$108,000	$0	$0	$0	$0	$108,000
		BEA U.C. per EA			*200*	*$180.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
	Program / Debug DMT		1.00	EA	200	SYSENG	$36,000	$0	$0	$0	$0	$36,000
		BEA U.C. per EA			*400*	*$180.00*	*72000*	*0*	*0*	*0*	*0*	*72000*
	Write test Spec and Procedure		1.00	EA	400	SYSENG	$72,000	$0	$0	$0	$0	$72,000
		BEA U.C. per EA			*200*	*$180.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
	Perform DMT Testing		1.00	EA	200	SYSENG	$36,000	$0	$0	$0	$0	$36,000
		BEA U.C. per EA			*200*	*$95.00*	*19000*	*0*	*0*	*0*	*0*	*19000*
	Perform DMT Testing		1.00	EA	200	CRAFT	$19,000	$0	$0	$0	$0	$19,000
		BEA U.C. per EA			*40*	*$180.00*	*7200*	*0*	*0*	*0*	*0*	*7200*
	V&V Software Test Plan		1.00	EA	40	SYSENG	$7,200	$0	$0	$0	$0	$7,200
		BEA U.C. per EA			*120*	*$180.00*	*21600*	*0*	*0*	*0*	*0*	*21600*
	V&V Software Test Procedure		1.00	EA	120	SYSENG	$21,600	$0	$0	$0	$0	$21,600
		BEA U.C. per EA			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	V&V Software Plan/Procedure review (Design Review)		1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400
		BEA U.C. per EA			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	V&V Procedure Execution		1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400
		BEA U.C. per EA			*400*	*$180.00*	*72000*	*0*	*0*	*0*	*0*	*72000*
	Drawings and documentation (New User Manual) Including new user manual		1.00	EA	400	SYSENG	$72,000	$0	$0	$0	$0	$72,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code / Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
002 Dedicated Microprocessor Testor (DMT) (NEW)											
Memo: ***Design new Dedicated Microprocessor Testor (DMT)***											
	BEA U.C. per EA			*100*	*$100.00*	*10000*	*0*	*0*	*0*	*0*	*10000*
Drafting		1.00	EA	100	DRAFT	$10,000	$0	$0	$0	$0	$10,000
Subtotal						$695,350	$0	$66,000	$0	$0	$761,350
Sales Tax						$0	$0	$3,600	$0	$0	$3,600
Markups	0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate											**$764,950**
Escalation						$90,743	$0	$9,083	$0	$0	$99,826
Management Reserve						$127,364	$0	$12,748	$0	$0	$140,112
---Total 002 Dedicated Microprocessor Testor (DMT) (NEW)				**4,120**		**$913,457**	**$0**	**$91,431**	**$0**	**$0**	**$1,004,888**
TTR0017 Design New Manual Reactor Control System (MRCS)											
	BEA U.C. per EA			*800*	*$180.00*	*144000*	*0*	*0*	*0*	*0*	*144000*
Develop Functional Requirements Specifications for MRCS		1.00	EA	800	SYSENG	$144,000	$0	$0	$0	$0	$144,000
	BEA U.C. per EA			*600*	*$180.00*	*108000*	*0*	*0*	*0*	*0*	*108000*
Design new MRCS (Hardware)		1.00	EA	600	SYSENG	$108,000	$0	$0	$0	$0	$108,000
Memo: Hardware selection and cabinet design for new control room											
	BEA U.C. per EA			*400*	*$180.00*	*72000*	*0*	*0*	*0*	*0*	*72000*
Design new MRCS (Software) MRCS HMI Screen Design		1.00	EA	400	SYSENG	$72,000	$0	$0	$0	$0	$72,000
	BEA U.C. per EA			*600*	*$180.00*	*108000*	*0*	*0*	*0*	*0*	*108000*
Software requirements specification		1.00	EA	600	SYSENG	$108,000	$0	$0	$0	$0	$108,000
	BEA U.C. per EA			*800*	*$180.00*	*144000*	*0*	*0*	*0*	*0*	*144000*
Software detailed design description		1.00	EA	800	SYSENG	$144,000	$0	$0	$0	$0	$144,000
	BEA U.C. per EA			*600*	*$180.00*	*108000*	*0*	*0*	*0*	*0*	*108000*
Programming of MRCS HMI		1.00	EA	600	SYSENG	$108,000	$0	$0	$0	$0	$108,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0017 Design New Manual Reactor Control System (MRCS)												
	BEA	*U.C. per EA*	NJ12				*0*	*0*	*4500*	*0*	*0*	*4500*
	Allowance for BEA travel to vendors for inspection of proposed equipment		1.00	EA	0		$0	$0	$4,500	$0	$0	$4,500
	Memo: Assume $1500 each for no more than that 3 vendors											
	BEA	*U.C. per EA*	NJ12				*0*	*0*	*1500*	*0*	*0*	*1500*
	Allowance for BEA travel to vendor for FAT witness testing		1.00	EA	0		$0	$0	$1,500	$0	$0	$1,500
	Memo: Assume $1500 for the trip											
	BEA	*U.C. per EA*			*400*	*$180.00*	*72000*	*0*	*0*	*0*	*0*	*72000*
	Procure and install new MRCS		1.00	EA	400	SYSENG	$72,000	$0	$0	$0	$0	$72,000
	BEA	*U.C. per EA*			*600*	*$95.00*	*57000*	*0*	*0*	*0*	*0*	*57000*
	Procure and install new MRCS		1.00	EA	600	CRAFT	$57,000	$0	$0	$0	$0	$57,000
	BEA	*U.C. per EA*			*600*	*$180.00*	*108000*	*0*	*0*	*0*	*0*	*108000*
	Program new MRCS - Engr		1.00	EA	600	SYSENG	$108,000	$0	$0	$0	$0	$108,000
	BEA	*U.C. per EA*			*800*	*$180.00*	*144000*	*0*	*0*	*0*	*0*	*144000*
	Test specification, procedures, supervision		1.00	EA	800	SYSENG	$144,000	$0	$0	$0	$0	$144,000
	BEA	*U.C. per EA*			*600*	*$95.00*	*57000*	*0*	*0*	*0*	*0*	*57000*
	Program and test new MRCS - Technician		1.00	EA	600	CRAFT	$57,000	$0	$0	$0	$0	$57,000
	BEA	*U.C. per EA*			*40*	*$180.00*	*7200*	*0*	*0*	*0*	*0*	*7200*
	V&V Software Test Plan		1.00	EA	40	SYSENG	$7,200	$0	$0	$0	$0	$7,200
	BEA	*U.C. per EA*			*120*	*$180.00*	*21600*	*0*	*0*	*0*	*0*	*21600*
	V&V Software Test Procedure		1.00	EA	120	SYSENG	$21,600	$0	$0	$0	$0	$21,600
	BEA	*U.C. per EA*			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	V&V Software Plan/Procedure review (Design Review)		1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0017 Design New Manual Reactor Control System (MRCS)												
	BEA	*U.C. per EA*			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	V&V Procedure Execution		1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400
	Subtotal						$1,179,600	$0	$6,000	$0	$0	$1,185,600
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$1,185,600**
	Escalation						$153,938	$0	$783	$0	$0	$154,721
	Management Reserve						$217,106	$0	$1,104	$0	$0	$218,210
---Total	**TTR0017 Design New Manual Reactor Control System (MRCS)**				**7,120**		**$1,550,644**	**$0**	**$7,887**	**$0**	**$0**	**$1,558,531**
TTR0018 Procure and Install New Reactor Control System												
	BEA	*U.C. per EA*			*600*	*$195.00*	*117000*	*0*	*0*	*0*	*0*	*117000*
	Develop FRS for RCS		1.00	EA	600	DE/ENG	$117,000	$0	$0	$0	$0	$117,000
	BEA	*U.C. per EA*			*600*	*$195.00*	*117000*	*0*	*0*	*0*	*0*	*117000*
	INL Design Engineer (500 +/- 100)		1.00	EA	600	DE/ENG	$117,000	$0	$0	$0	$0	$117,000
Memo:	Design intergration of new MRCS, ARCS, Rod Hydraulic Transient Control											
	BEA	*U.C. per EA*			*400*	*$195.00*	*78000*	*0*	*0*	*0*	*0*	*78000*
	Software Requirements Specification		1.00	EA	400	DE/ENG	$78,000	$0	$0	$0	$0	$78,000
	BEA	*U.C. per EA*			*600*	*$195.00*	*117000*	*0*	*0*	*0*	*0*	*117000*
	Software Detailed Design Specification		1.00	EA	600	DE/ENG	$117,000	$0	$0	$0	$0	$117,000
	BEA	*U.C. per EA*			*400*	*$195.00*	*78000*	*0*	*0*	*0*	*0*	*78000*
	Software Programming / Debugging		1.00	EA	400	DE/ENG	$78,000	$0	$0	$0	$0	$78,000
	BEA	*U.C. per EA*			*300*	*$195.00*	*58500*	*0*	*0*	*0*	*0*	*58500*
	Design Hydraulic Control interfaces / cabinet		1.00	EA	300	DE/ENG	$58,500	$0	$0	$0	$0	$58,500
	BEA	*U.C. per EA*			*200*	*$195.00*	*39000*	*0*	*0*	*0*	*0*	*39000*
	Review Vendor Rod Hydraulic control design		1.00	EA	200	DE/ENG	$39,000	$0	$0	$0	$0	$39,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0018 Procure and Install New Reactor Control System													
		BEA	*U.C. per EA*		NJ12			*0*	*0*	*4500*	*0*	*0*	*4500*
	Allowance for BEA travel to vendors for inspection of proposed equipment			1.00	EA	0		$0	$0	$4,500	$0	$0	$4,500
Memo:	Assume $1500 each for no more than that 3 vendors												
		BEA	*U.C. per EA*		NJ12			*0*	*0*	*1500*	*0*	*0*	*1500*
	Allowance for BEA travel to vendor for FAT witness testing			1.00	EA	0		$0	$0	$1,500	$0	$0	$1,500
Memo:	Assume $1500 for the trip												
		BEA	*U.C. per EA*			*300*	*$195.00*	*58500*	*0*	*0*	*0*	*0*	*58500*
	Procure and install RCS			1.00	EA	300	DE/ENG	$58,500	$0	$0	$0	$0	$58,500
		BEA	*U.C. per EA*			*300*	*$95.00*	*28500*	*0*	*0*	*0*	*0*	*28500*
	Install RCS			1.00	EA	300	CRAFT	$28,500	$0	$0	$0	$0	$28,500
		BEA	*U.C. per EA*		NM60	*550*	*$105.00*	*57750*	*0*	*240000*	*0*	*0*	*297750*
	ARCS Hardware / computers			1.00	EA	550	IT/TEC	$57,750	$0	$240,000	$0	$0	$297,750
		BEA	*U.C. per LS*		NM60	*250*	*$105.00*	*26250*	*0*	*30000*	*0*	*0*	*56250*
	MRCS Hardware			1.00	LS	250	IT/TEC	$26,250	$0	$30,000	$0	$0	$56,250
		BEA	*U.C. per LS*			*40*	*$65.00*	*2600*	*0*	*0*	*0*	*0*	*2600*
	INL Admin, Doc. control			1.00	LS	40	ADM	$2,600	$0	$0	$0	$0	$2,600
		BEA	*U.C. per LS*			*80*	*$120.00*	*9600*	*0*	*0*	*0*	*0*	*9600*
	INL Planner			1.00	LS	80	PLANNER	$9,600	$0	$0	$0	$0	$9,600
	Subtotal							$787,700	$0	$276,000	$0	$0	$1,063,700
	Sales Tax							$0	$0	$16,200	$0	$0	$16,200
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$1,079,900**
	Escalation							$102,795	$0	$38,132	$0	$0	$140,927
	Management Reserve							$144,418	$0	$53,572	$0	$0	$197,990
---Total	**TTR0018 Procure and Install New Reactor Control System**					**4,620**		**$1,034,912**	**$0**	**$383,904**	**$0**	**$0**	**$1,418,817**

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0019 Program New Reactor Control System													
		BEA	*U.C. per EA*			*800*	*$195.00*	*156000*	*0*	*0*	*0*	*0*	*156000*
	Test Specification and Procedures			1.00	EA	800	CS	$156,000	$0	$0	$0	$0	$156,000
		BEA	*U.C. per EA*			*300*	*$195.00*	*58500*	*0*	*0*	*0*	*0*	*58500*
	Perform RCS Integrated Test			1.00	EA	300	CS	$58,500	$0	$0	$0	$0	$58,500
		BEA	*U.C. per EA*			*200*	*$95.00*	*19000*	*0*	*0*	*0*	*0*	*19000*
	Perform RCS Integrated Test			1.00	EA	200	CRAFT	$19,000	$0	$0	$0	$0	$19,000
		BEA	*U.C. per EA*			*400*	*$105.00*	*42000*	*0*	*0*	*0*	*0*	*42000*
	INL Technical Editor			1.00	EA	400	IT/TEC	$42,000	$0	$0	$0	$0	$42,000
		BEA	*U.C. per EA*			*100*	*$120.00*	*12000*	*0*	*0*	*0*	*0*	*12000*
	INL Admin, Document Control			1.00	EA	100	RE/OPR	$12,000	$0	$0	$0	$0	$12,000
	Subtotal							$287,500	$0	$0	$0	$0	$287,500
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$287,500**
	Escalation							$37,519	$0	$0	$0	$0	$37,519
	Management Reserve							$54,408	$0	$0	$0	$0	$54,408
---Total	**TTR0019 Program New Reactor Control System**					**1,800**		**$379,427**	**$0**	**$0**	**$0**	**$0**	**$379,427**
TTR0020 Drawings and Documentation													
		BEA	*U.C. per LS*			*1000*	*$180.00*	*180000*	*0*	*0*	*0*	*0*	*180000*
	INL Design Engineer			1.00	LS	1,000	SYSENG	$180,000	$0	$0	$0	$0	$180,000
		BEA	*U.C. per LS*			*1160*	*$100.00*	*116000*	*0*	*0*	*0*	*0*	*116000*
	INL Drafter			1.00	LS	1,160	DRAFT	$116,000	$0	$0	$0	$0	$116,000
		BEA	*U.C. per LS*			*400*	*$90.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
	INL Tech Editor			1.00	LS	400	TECH/EDIT	$36,000	$0	$0	$0	$0	$36,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code / Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0020 Drawings and Documentation												
	BEA	*U.C. per LS*			*80*	*$65.00*	*5200*	*0*	*0*	*0*	*0*	*5200*
INL Admin, Doc. control			1.00	LS	80	ADM	$5,200	$0	$0	$0	$0	$5,200
Subtotal							$337,200	$0	$0	$0	$0	$337,200
Sales Tax							$0	$0	$0	$0	$0	$0
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$337,200**
Escalation							$44,005	$0	$0	$0	$0	$44,005
Management Reserve							$63,280	$0	$0	$0	$0	$63,280
---Total TTR0020 Drawings and Documentation					**2,640**		**$444,485**	**$0**	**$0**	**$0**	**$0**	**$444,485**
TTR0021 Fiber Optic Cable & Power Cable												
	BEA	*U.C. per EA*			*175*	*$195.00*	*34125*	*0*	*0*	*0*	*0*	*34125*
Design -Fiber Cable Distribution cabinets (FCDC)			1.00	EA	175	DE/ENG	$34,125	$0	$0	$0	$0	$34,125
	BEA	*U.C. per EA*			*80*	*$100.00*	*8000*	*0*	*0*	*0*	*0*	*8000*
Create 2 cabinet drawings			1.00	EA	80	DRAFT	$8,000	$0	$0	$0	$0	$8,000
	BEA	*U.C. per EA*			*16*	*$195.00*	*3120*	*0*	*0*	*0*	*0*	*3120*
Review cabinet drawings			1.00	EA	16	DE/ENG	$3,120	$0	$0	$0	$0	$3,120
	BEA	*U.C. per EA*			*8*	*$205.00*	*1640*	*0*	*0*	*0*	*0*	*1640*
Approve cabinet drawings			1.00	EA	8	PM/PE	$1,640	$0	$0	$0	$0	$1,640
	BEA	*U.C. per EA*			*40*	*$195.00*	*7800*	*0*	*0*	*0*	*0*	*7800*
Research vendors for FCDC			1.00	EA	40	DE/ENG	$7,800	$0	$0	$0	$0	$7,800
	BEA	*U.C. per EA*			*16*	*$90.00*	*1440*	*0*	*0*	*0*	*0*	*1440*
Procure FCDC			1.00	EA	16	PROC	$1,440	$0	$0	$0	$0	$1,440
	BEA	*U.C. per EA*		NM60			*0*	*0*	*10000*	*0*	*0*	*10000*
Build - FCDC			2.00	EA	0		$0	$0	$20,000	$0	$0	$20,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0021 Fiber Optic Cable & Power Cable													
		BEA	*U.C. per EA*			*80*	*$95.00*	*7600*	*0*	*0*	*0*	*0*	*7600*
	Install - FCDC			1.00	EA	80	ELEC1	$7,600	$0	$0	$0	$0	$7,600
		BEA	*U.C. per EA*			*80*	*$205.00*	*16400*	*0*	*0*	*0*	*0*	*16400*
	Determine fiber cable needs for trench including spares			1.00	EA	80	PM/PE	$16,400	$0	$0	$0	$0	$16,400
		BEA	*U.C. per EA*			*8*	*$205.00*	*1640*	*0*	*0*	*0*	*0*	*1640*
	Approve fiber cable needs			1.00	EA	8	PM/PE	$1,640	$0	$0	$0	$0	$1,640
		BEA	*U.C. per EA*			*80*	*$205.00*	*16400*	*0*	*0*	*0*	*0*	*16400*
	Procure fiber cable (10,500')			1.00	EA	80	PM/PE	$16,400	$0	$0	$0	$0	$16,400
		BEA	*U.C. per EA*		NM60			*0*	*0*	*52500*	*0*	*0*	*52500*
	Fiber Cable, Assume 3 rolls of 3500 ft each			1.00	EA	0		$0	$0	$52,500	$0	$0	$52,500
Memo: 3500 ft of Belden #B9C39IT, Double Jacket, armored, loose tube, outdoor, direct burial, 72 fibers, 50/125um, 10GB-300m													
		BEA	*U.C. per EA*			*60*	*$95.00*	*5700*	*0*	*0*	*0*	*0*	*5700*
	Survey for new Fiber Cable Path with ground radar, stake and measure			2.00	EA	120	CRAFT	$11,400	$0	$0	$0	$0	$11,400
		BEA	*U.C. per EA*			*60*	*$195.00*	*11700*	*0*	*0*	*0*	*0*	*11700*
	Supervise and record data			1.00	EA	60	DE/ENG	$11,700	$0	$0	$0	$0	$11,700
		GEN1	*U.C. per EA*			*5000*	*$95.00*	*475000*	*0*	*0*	*0*	*0*	*475000*
	Excavate trench for new fiber cable (3000')			1.00	EA	5,000	CRAFT	$475,000	$0	$0	$0	$0	$475,000
Memo: 2 crews of 5, dig 30 feet per day per crew for 50 days													
		GEN1	*U.C. per EA*			*1000*	*$95.00*	*95000*	*0*	*0*	*0*	*0*	*95000*
	Supervisor - 1 per crew			1.00	EA	1,000	ELECF	$95,000	$0	$0	$0	$0	$95,000
		GEN1	*U.C. per EA*			*60*	*$95.00*	*5700*	*0*	*0*	*0*	*0*	*5700*
				1.00	EA	60	CRAFT	$5,700	$0	$0	$0	$0	$5,700
Memo: Use spare conduit openings estimated 50 feet													
		GEN1	*U.C. per EA*			*12*	*$95.00*	*1140*	*0*	*0*	*0*	*0*	*1140*
	Supervisor - 1 per crew			1.00	EA	12	ELECF	$1,140	$0	$0	$0	$0	$1,140

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0021 Fiber Optic Cable & Power Cable												
	GEN1	*U.C. per EA*			*1000*	*$95.00*	*95000*	*0*	*0*	*0*	*0*	*95000*
	Line both trenches with 2" of sand		1.00	EA	1,000	CRAFT	$95,000	$0	$0	$0	$0	$95,000
Memo: Line both trenches with 2" of sand or other suitable material, 2 crews of 5, 150 feet per day per crew per day												
	GEN1	*U.C. per EA*			*200*	*$95.00*	*19000*	*0*	*0*	*0*	*0*	*19000*
	Supervisor - 1 per crew		1.00	EA	200	ELECF	$19,000	$0	$0	$0	$0	$19,000
	GEN1	*U.C. per EA*		NM80			*0*	*0*	*1*	*0*	*0*	*1*
	Sand - estimated 38 cu yd at $50 each		1.00	EA	0		$0	$0	$1	$0	$0	$1
	016ELEC	*U.C. per EA*			*400*	*$95.00*	*38000*	*0*	*0*	*0*	*0*	*38000*
	Install 3 fiber cables in trench		1.00	EA	400	CRAFT	$38,000	$0	$0	$0	$0	$38,000
Memo: 2 crews of 4 electricians for 5 days												
	016ELEC	*U.C. per EA*			*100*	*$95.00*	*9500*	*0*	*0*	*0*	*0*	*9500*
	Supervisor - 1 per crew		1.00	EA	100	ELECF	$9,500	$0	$0	$0	$0	$9,500
	016ELEC	*U.C. per EA*					*0*	*25000*	*0*	*0*	*0*	*25000*
	Pulling machine, rollers, spool holders, portable generators, small crane		1.00	EA	0		$0	$25,000	$0	$0	$0	$25,000
	BEA	*U.C. per EA*			*20*	*$95.00*	*1900*	*0*	*0*	*0*	*0*	*1900*
	Indentify installed metal clad power cable and control cables in manhole		1.00	EA	20	CRAFT	$1,900	$0	$0	$0	$0	$1,900
Memo: (Previously used for Control Room UPS feed, Rod Control and Scram)												
	BEA	*U.C. per EA*			*16*	*$90.00*	*1440*	*0*	*0*	*0*	*0*	*1440*
	Procure Copper power cables and power cables		1.00	EA	16	PROC	$1,440	$0	$0	$0	$0	$1,440
	BEA	*U.C. per EA*		NM60			*0*	*0*	*10000*	*0*	*0*	*10000*
	Power Cable, assumed identical installed cable, 1000 ft minimum		1.00	EA	0		$0	$0	$10,000	$0	$0	$10,000
	BEA	*U.C. per EA*		NM60			*0*	*0*	*2500*	*0*	*0*	*2500*
	Control cables are assumed equivalent, 500 feet minimum		1.00	EA	0		$0	$0	$2,500	$0	$0	$2,500

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0021 Fiber Optic Cable & Power Cable												
016ELEC	*U.C. per EA*				*120*	*$95.00*	*11400*	*0*	*0*	*0*	*0*	*11400*
Install power and control cables			1.00	EA	120	CRAFT	$11,400	$0	$0	$0	$0	$11,400
Memo: Install power and control cables from manhole to fiber cable trench then to building 721. Estimated 200 feet, 1 crew of 4 for 3 days.												
016ELEC	*U.C. per EA*				*30*	*$95.00*	*2850*	*0*	*0*	*0*	*0*	*2850*
Supervisor- 1 per crew			1.00	EA	30	ELECF	$2,850	$0	$0	$0	$0	$2,850
016ELEC	*U.C. per EA*				*200*	*$95.00*	*19000*	*0*	*0*	*0*	*0*	*19000*
Splice power and control cables in manhole and building 721			1.00	EA	200	CRAFT	$19,000	$0	$0	$0	$0	$19,000
016ELEC	*U.C. per EA*				*240*	*$95.00*	*22800*	*0*	*0*	*0*	*0*	*22800*
Enter bldg 721 with fiber, power, control cables, and seal all penetrations			1.00	EA	240	CRAFT	$22,800	$0	$0	$0	$0	$22,800
016ELEC	*U.C. per EA*				*460*	*$95.00*	*43700*	*0*	*0*	*0*	*0*	*43700*
Terminate - Fiber, power, and control in new control room panels			1.00	EA	460	CRAFT	$43,700	$0	$0	$0	$0	$43,700
016ELEC	*U.C. per EA*				*390*	*$95.00*	*37050*	*0*	*0*	*0*	*0*	*37050*
Supervise cable installation			1.00	EA	390	ELECF	$37,050	$0	$0	$0	$0	$37,050
GEN1	*U.C. per EA*				*80*	*$95.00*	*7600*	*0*	*0*	*0*	*0*	*7600*
Penetrate TREAT bldg walls as needed with new fiber cables			1.00	EA	80	CRAFT	$7,600	$0	$0	$0	$0	$7,600
BEA	*U.C. per EA*				*80*	*$95.00*	*7600*	*0*	*0*	*0*	*0*	*7600*
Terminate fiber cables in the FCDC in plant			2.00	EA	160	CRAFT	$15,200	$0	$0	$0	$0	$15,200
BEA	*U.C. per EA*				*120*	*$95.00*	*11400*	*0*	*0*	*0*	*0*	*11400*
Supervise cable installation			1.00	EA	120	ELECF	$11,400	$0	$0	$0	$0	$11,400
BEA	*U.C. per EA*				*160*	*$95.00*	*15200*	*0*	*0*	*0*	*0*	*15200*
Test all fibers of each cable including spares and record results			1.00	EA	160	CRAFT	$15,200	$0	$0	$0	$0	$15,200
BEA	*U.C. per EA*				*80*	*$95.00*	*7600*	*0*	*0*	*0*	*0*	*7600*
Test all power cables from plant power source to bldg 721 and control room			2.00	EA	160	CRAFT	$15,200	$0	$0	$0	$0	$15,200

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0021 Fiber Optic Cable & Power Cable													
	BEA	*U.C. per EA*				*80*	*$95.00*	*7600*	*0*	*0*	*0*	*0*	*7600*
	Supervise cable testing			1.00	EA	80	ELECF	$7,600	$0	$0	$0	$0	$7,600
	Subtotal							$1,071,945	$25,000	$85,001	$0	$0	$1,181,946
	Sales Tax							$0	$0	$5,100	$0	$0	$5,100
	Markups		32.07%					$370,159	$10,483	$0	$0	$0	$380,643
	Subtotal Estimate												**$1,567,689**
	Escalation							$188,195	$4,631	$11,758	$0	$0	$204,583
	Management Reserve							$107,224	$2,638	$6,699	$0	$0	$116,562
---Total	**TTR0021 Fiber Optic Cable & Power Cable**					**10,771**		**$1,737,523**	**$42,752**	**$108,559**	**$0**	**$0**	**$1,888,834**
TTR0031 DAS Hardware													
	BEA	*U.C. per EA*				*800*	*$195.00*	*156000*	*0*	*0*	*0*	*0*	*156000*
	Design new DAS using modern technology and cabinets			1.00	EA	800	DE/ENG	$156,000	$0	$0	$0	$0	$156,000
	BEA	*U.C. per EA*			NJ12			*0*	*0*	*4500*	*0*	*0*	*4500*
	Allowance for BEA travel to vendors for inspection of proposed equipment			1.00	EA	0		$0	$0	$4,500	$0	$0	$4,500
Memo:	Assume $1500 each for no more than that 3 vendors												
	BEA	*U.C. per EA*			NJ12			*0*	*0*	*1500*	*0*	*0*	*1500*
	Allowance for BEA travel to vendor for FAT witness testing			1.00	EA	0		$0	$0	$1,500	$0	$0	$1,500
Memo:	Assume $1500 for the trip												
	BEA	*U.C. per EA*			NM60	*500*	*$195.00*	*97500*	*0*	*660000*	*0*	*0*	*757500*
	Procure and install DAS			1.00	EA	500	DE/ENG	$97,500	$0	$660,000	$0	$0	$757,500
	BEA	*U.C. per EA*				*600*	*$95.00*	*57000*	*0*	*0*	*0*	*0*	*57000*
	Procure and install DAS			1.00	EA	600	CRAFT	$57,000	$0	$0	$0	$0	$57,000
Memo:	Construction activities of removal of existing hardware and installation/wiring of new hardware.												
	BEA	*U.C. per EA*				*300*	*$195.00*	*58500*	*0*	*0*	*0*	*0*	*58500*
	INL Engineering Support			1.00	EA	300	DE/ENG	$58,500	$0	$0	$0	$0	$58,500

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0031 DAS Hardware											
BEA	*U.C. per EA*			*40*	*$65.00*	*2600*	*0*	*0*	*0*	*0*	*2600*
INL Admin, Document Control		1.00	EA	40	ADM	$2,600	$0	$0	$0	$0	$2,600
Subtotal						$371,600	$0	$666,000	$0	$0	$1,037,600
Sales Tax						$0	$0	$39,600	$0	$0	$39,600
Markups	0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate											**$1,077,200**
Escalation						$48,494	$0	$92,081	$0	$0	$140,575
Management Reserve						$68,478	$0	$130,026	$0	$0	$198,504
—Total TTR0031 DAS Hardware				**2,240**		**$488,571**	**$0**	**$927,707**	**$0**	**$0**	**$1,416,279**
TTR0032 Program and Test New DAS											
BEA	*U.C. per EA*			*1400*	*$195.00*	*273000*	*0*	*0*	*0*	*0*	*273000*
Reverse engineer DAS software modules		1.00	EA	1,400	CS	$273,000	$0	$0	$0	$0	$273,000
BEA	*U.C. per EA*			*800*	*$195.00*	*156000*	*0*	*0*	*0*	*0*	*156000*
Write DAS Software Specification		1.00	EA	800	CS	$156,000	$0	$0	$0	$0	$156,000
BEA	*U.C. per EA*			*800*	*$195.00*	*156000*	*0*	*0*	*0*	*0*	*156000*
Program/debug DAS applications		1.00	EA	800	CS	$156,000	$0	$0	$0	$0	$156,000
BEA	*U.C. per EA*			*2000*	*$90.00*	*180000*	*0*	*0*	*0*	*0*	*180000*
IT Technical Support/Testing		1.00	EA	2,000	TECH/EDIT	$180,000	$0	$0	$0	$0	$180,000
BEA	*U.C. per EA*			*40*	*$65.00*	*2600*	*0*	*0*	*0*	*0*	*2600*
INL Admin, Document Control		1.00	EA	40	ADM	$2,600	$0	$0	$0	$0	$2,600
BEA	*U.C. per EA*			*80*	*$120.00*	*9600*	*0*	*0*	*0*	*0*	*9600*
INL Planner		1.00	EA	80	PLANNER	$9,600	$0	$0	$0	$0	$9,600
BEA	*U.C. per EA*			*250*	*$120.00*	*30000*	*0*	*0*	*0*	*0*	*30000*
INL Reactor Operator		2.00	EA	500	RE/OPR	$60,000	$0	$0	$0	$0	$60,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0032 Program and Test New DAS													
		BEA	*U.C. per EA*			*40*	*$180.00*	*7200*	*0*	*0*	*0*	*0*	*7200*
	V&V Software Test Plan			1.00	EA	40	SYSENG	$7,200	$0	$0	$0	$0	$7,200
		BEA	*U.C. per EA*			*120*	*$180.00*	*21600*	*0*	*0*	*0*	*0*	*21600*
	V&V Software Test Procedure			1.00	EA	120	SYSENG	$21,600	$0	$0	$0	$0	$21,600
		BEA	*U.C. per EA*			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	V&V Software Plan/Procedure review (Design Review)			1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400
		BEA	*U.C. per EA*			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	V&V Procedure Execution			1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400
	Subtotal							$894,800	$0	$0	$0	$0	$894,800
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$894,800**
	Escalation							$116,771	$0	$0	$0	$0	$116,771
	Management Reserve							$165,187	$0	$0	$0	$0	$165,187
---Total	**TTR0032 Program and Test New DAS**					**5,940**		**$1,176,758**	**$0**	**$0**	**$0**	**$0**	**$1,176,758**
TTR0036 Control Room Facilities and Remaining Office Space													
		BEA	*U.C. per EA*			*275*	*$195.00*	*53625*	*0*	*0*	*0*	*0*	*53625*
	HVAC engineering			1.00	EA	275	DE/ENG	$53,625	$0	$0	$0	$0	$53,625
		BEA	*U.C. per EA*			*300*	*$195.00*	*58500*	*0*	*0*	*0*	*0*	*58500*
	Electrical engineering			1.00	EA	300	DE/ENG	$58,500	$0	$0	$0	$0	$58,500
		BEA	*U.C. per EA*			*255*	*$195.00*	*49725*	*0*	*0*	*0*	*0*	*49725*
	Civil/Structural Engineering			1.00	EA	255	DE/ENG	$49,725	$0	$0	$0	$0	$49,725
		BEA	*U.C. per EA*			*200*	*$195.00*	*39000*	*0*	*0*	*0*	*0*	*39000*
	Sanitation engineering			1.00	EA	200	DE/ENG	$39,000	$0	$0	$0	$0	$39,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0036 Control Room Facilities and Remaining Office Space													
	BEA	*U.C. per EA*				*380*	*$100.00*	*38000*	*0*	*0*	*0*	*0*	*38000*
	INL drawing update/revision			1.00	EA	380	DRAFT	$38,000	$0	$0	$0	$0	$38,000
	BEA	*U.C. per EA*				*20*	*$180.00*	*3600*	*0*	*0*	*0*	*0*	*3600*
	INL drawing review and approval			1.00	EA	20	REA/SUP	$3,600	$0	$0	$0	$0	$3,600
	BEA	*U.C. per LS*			NM60			*0*	*0*	*849600*	*0*	*0*	*849600*
	Office space facilities construction and equipment allowance			1.00	LS	0		$0	$0	$849,600	$0	$0	$849,600
Memo: 3/4 cost = (5900 ft2 x $144 per ft2)													
	Subtotal							$242,450	$0	$849,600	$0	$0	$1,092,050
	Sales Tax							$0	$0	$50,976	$0	$0	$50,976
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$1,143,026**
	Escalation							$31,640	$0	$117,525	$0	$0	$149,165
	Management Reserve							$44,819	$0	$166,479	$0	$0	$211,298
---Total	**TTR0036 Control Room Facilities and Remaining Office Space**					**1,430**		**$318,909**	**$0**	**$1,184,580**	**$0**	**$0**	**$1,503,489**
TTR0037 Control Room Panels, Displays and Controls													
	BEA	*U.C. per EA*				*600*	*$195.00*	*117000*	*0*	*0*	*0*	*0*	*117000*
	I&C engineering			1.00	EA	600	DE/ENG	$117,000	$0	$0	$0	$0	$117,000
	BEA	*U.C. per EA*				*200*	*$195.00*	*39000*	*0*	*0*	*0*	*0*	*39000*
	Electrical Engineering			1.00	EA	200	DE/ENG	$39,000	$0	$0	$0	$0	$39,000
	BEA	*U.C. per EA*				*300*	*$100.00*	*30000*	*0*	*0*	*0*	*0*	*30000*
	INL Drawing Update/revision			1.00	EA	300	DRAFT	$30,000	$0	$0	$0	$0	$30,000
	BEA	*U.C. per EA*				*40*	*$180.00*	*7200*	*0*	*0*	*0*	*0*	*7200*
	INL Drawing review/approval			1.00	EA	40	REA/SUP	$7,200	$0	$0	$0	$0	$7,200

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0037 Control Room Panels, Displays and Controls													
		BEA	*U.C. per EA*			*300*	*$180.00*	*54000*	*0*	*0*	*0*	*0*	*54000*
	Reactor supervisor review			1.00	EA	300	REA/SUP	$54,000	$0	$0	$0	$0	$54,000
		BEA	*U.C. per EA*		NM60			*0*	*0*	*485000*	*0*	*0*	*485000*
	Office space facilities construction and equipment allowance			1.00	EA	0		$0	$0	$485,000	$0	$0	$485,000
Memo: Includes $50 per ft2 for specialty cable (3/4 cost 2500 ft2 x $194 per ft2)													
		BEA	*U.C. per EA*		NM60			*0*	*0*	*100000*	*0*	*0*	*100000*
	Allowance for 2 qualified computer-driven displays			1.00	EA	0		$0	$0	$100,000	$0	$0	$100,000
		BEA	*U.C. per EA*		NM60			*0*	*0*	*100000*	*0*	*0*	*100000*
	Procure and install six panes			1.00	EA	0		$0	$0	$100,000	$0	$0	$100,000
		BEA	*U.C. per EA*		NM60			*0*	*0*	*1000*	*0*	*0*	*1000*
	Camera Allowance			6.00	EA	0		$0	$0	$6,000	$0	$0	$6,000
		BEA	*U.C. per EA*		NM60			*0*	*0*	*5000*	*0*	*0*	*5000*
	Recording Device Allowance			1.00	EA	0		$0	$0	$5,000	$0	$0	$5,000
	Subtotal							$247,200	$0	$696,000	$0	$0	$943,200
	Sales Tax							$0	$0	$12,660	$0	$0	$12,660
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$955,860**
	Escalation							$32,260	$0	$92,480	$0	$0	$124,740
	Management Reserve							$46,713	$0	$133,913	$0	$0	$180,625
---Total TTR0037 Control Room Panels, Displays and Controls						**1,440**		**$326,172**	**$0**	**$935,053**	**$0**	**$0**	**$1,261,225**
TTR0038 Miscellaneous Cost To Relocate Control Room													
		BEA	*U.C. per EA*			*90*	*$100.00*	*9000*	*0*	*0*	*0*	*0*	*9000*
	INL Drawing update/revision			1.00	EA	90	DRAFT	$9,000	$0	$0	$0	$0	$9,000
		BEA	*U.C. per EA*			*40*	*$180.00*	*7200*	*0*	*0*	*0*	*0*	*7200*
	INL Drawing review/approval			1.00	EA	40	REA/SUP	$7,200	$0	$0	$0	$0	$7,200

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0038 Miscellaneous Cost To Relocate Control Room												
	BEA	*U.C. per EA*			*4*	*$195.00*	*780*	*0*	*0*	*0*	*0*	*780*
	Engineering		1.00	EA	4	DE/ENG	$780	$0	$0	$0	$0	$780
Memo:	Remove control rod equipment from panels											
	BEA	*U.C. per EA*			*6*	*$95.00*	*570*	*0*	*0*	*0*	*0*	*570*
	Technician		1.00	EA	6	CRAFT	$570	$0	$0	$0	$0	$570
Memo:	Remove control rod equipment from panels											
	BEA	*U.C. per EA*			*24*	*$95.00*	*2280*	*0*	*0*	*0*	*0*	*2280*
	Install temporary power and lighting (Electrician)		1.00	EA	24	ELEC1	$2,280	$0	$0	$0	$0	$2,280
	BEA	*U.C. per EA*			*60*	*$195.00*	*11700*	*0*	*0*	*0*	*0*	*11700*
	De-Energize control room (Engineering)		1.00	EA	60	DE/ENG	$11,700	$0	$0	$0	$0	$11,700
	BEA	*U.C. per EA*			*80*	*$95.00*	*7600*	*0*	*0*	*0*	*0*	*7600*
	De-Energize control room (Technician)		1.00	EA	80	CRAFT	$7,600	$0	$0	$0	$0	$7,600
	BEA	*U.C. per EA*			*50*	*$95.00*	*4750*	*0*	*0*	*0*	*0*	*4750*
	Remove instrument and panels (Technician)		1.00	EA	50	CRAFT	$4,750	$0	$0	$0	$0	$4,750
	BEA	*U.C. per EA*			*50*	*$95.00*	*4750*	*0*	*0*	*0*	*0*	*4750*
	Remove instrument and panels (Laborer)		1.00	EA	50	CRAFT	$4,750	$0	$0	$0	$0	$4,750
	BEA	*U.C. per EA*			*24*	*$95.00*	*2280*	*0*	*0*	*0*	*0*	*2280*
	Remove wire / cable from control room building (Electrician)		1.00	EA	24	ELEC1	$2,280	$0	$0	$0	$0	$2,280
	GEN1	*U.C. per SF*		NM80			*0*	*0*	*1*	*25*	*0*	*26*
	Allowance for Asbestos removal		5,544.00	SF	0		$0	$0	$5,544	$138,600	$0	$144,144
Memo:	Allowance for Asbestos removal (estimate ($15 - $25 per ft2 x 16,800 ft2), assume only 1/3 of building will require abatement.											
	BEA	*U.C. per EA*			*30*	*$95.00*	*2850*	*0*	*0*	*0*	*0*	*2850*
	Pull cable back from manhole		1.00	EA	30	ELEC1	$2,850	$0	$0	$0	$0	$2,850
	BEA	*U.C. per EA*			*12*	*$95.00*	*1140*	*0*	*0*	*0*	*0*	*1140*
	Remove temporary power and lighting		1.00	EA	12	ELEC1	$1,140	$0	$0	$0	$0	$1,140

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0038 Miscellaneous Cost To Relocate Control Room												
	BEA	*U.C. per LS*					*0*	*10000*	*0*	*0*	*0*	*10000*
	Remove control room building		1.00	LS	0		$0	$10,000	$0	$0	$0	$10,000
	Memo: Assume an outside contractor and fixed price											
	Subtotal						$54,900	$10,000	$5,544	$138,600	$0	$209,044
	Sales Tax						$0	$0	$333	$0	$0	$333
	Markups	28.94%					$0	$0	$2,464	$58,119	$0	$60,583
	Subtotal Estimate											**$269,960**
	Escalation						$7,164	$1,305	$1,088	$25,672	$0	$35,230
	Management Reserve						$10,234	$1,864	$1,555	$36,670	$0	$50,323
---Total	**TTR0038 Miscellaneous Cost To Relocate Control Room**				**470**		**$72,298**	**$13,169**	**$10,984**	**$259,061**	**$0**	**$355,513**
001 Replacement Allowance for Obsolete Parts												
	BEA	*U.C. per LS*		NM60			*0*	*0*	*70000*	*0*	*0*	*70000*
	Allowance for obsolete replacement parts		1.00	LS	0		$0	$0	$70,000	$0	$0	$70,000
	BEA	*U.C. per EA*		NM60	*80*	*$95.00*	*7600*	*0*	*50000*	*0*	*0*	*57600*
	HVAC unit, Complete (Hodoscope Unit 7.5 TN)		1.00	EA	80	CRAFT	$7,600	$0	$50,000	$0	$0	$57,600
	BEA	*U.C. per EA*		NM60	*106*	*$95.00*	*10070*	*0*	*60000*	*0*	*0*	*70070*
	HVAC unit, Complete (Room 108 I&C Unit 13 TN)		2.00	EA	212	CRAFT	$20,140	$0	$120,000	$0	$0	$140,140

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
001 Replacement Allowance for Obsolete Parts												
	BEA	*U.C. per EA*	NM60	*43*	*$95.00*		*4085*	*0*	*54000*	*0*	*0*	*58085*
	HVAC unit, Complete (Room 109 Electronic Shop Unit 8.5 TN)		1.00 EA	43	CRAFT		$4,085	$0	$54,000	$0	$0	$58,085
	Subtotal						$31,825	$0	$294,000	$0	$0	$325,825
	Sales Tax						$0	$0	$17,640	$0	$0	$17,640
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$343,465**
	Escalation						$4,153	$0	$40,669	$0	$0	$44,822
	Management Reserve						$5,990	$0	$58,655	$0	$0	$64,645
—Total	**001 Replacement Allowance for Obsolete Parts**			**335**			**$41,968**	**$0**	**$410,964**	**$0**	**$0**	**$452,932**

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002 Relocation / Supplies

Memo: ***Vehicle lease costs are based on INL GSA leasing program, including fuel allowance. Assume two mid sized sedans for the duration of the project (4-years).***

BEA	*U.C. per $$*	NM60				*0*	*0*	*1*	*0*	*0*	*1*
Office equipment and supplies		105,000.00 $$	0			$0	$0	$105,000	$0	$0	$105,000
BEA	*U.C. per $$*	NM60				*0*	*0*	*1*	*0*	*0*	*1*
Relocation of 5 new hires		175,000.00 $$	0			$0	$0	$175,000	$0	$0	$175,000
BEA	*U.C. per Years*	NR21				*0*	*0*	*3100*	*0*	*0*	*3100*
#1 Vehicle Lease (one Vehicle)		3.00 Years	0			$0	$0	$9,300	$0	$0	$9,300
BEA	*U.C. per Years*	NR21				*0*	*0*	*3100*	*0*	*0*	*3100*
#2 Vehicle Lease (one Vehicle)		3.00 Years	0			$0	$0	$9,300	$0	$0	$9,300
BEA	*U.C. per Miles*	NR21				*0*	*0*	*0.22*	*0*	*0*	*0.22*
#1 Fuel Usage per Vehicle, Assume 1200 miles/month		9,600.00 Miles	0			$0	$0	$2,112	$0	$0	$2,112

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
002 Relocation / Supplies												
Memo:	***Vehicle lease costs are based on INL GSA leasing program, including fuel allowance. Assume two mid sized sedans for the duration of the project (4-years).***											
	BEA	*U.C. per Miles*		NR21			*0*	*0*	*0.22*	*0*	*0*	*0.22*
	#1 Fuel Usage per Vehicle, Assume 1200 miles/month		9,600.00	Miles	0		$0	$0	$2,112	$0	$0	$2,112
	Subtotal						$0	$0	$302,824	$0	$0	$302,824
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$302,824**
	Escalation						$0	$0	$39,519	$0	$0	$39,519
	Management Reserve						$0	$0	$54,819	$0	$0	$54,819
---Total	**002 Relocation / Supplies**				**0**		**$0**	**$0**	**$397,162**	**$0**	**$0**	**$397,162**
003 TREAT Radiation Monitoring System Main OPS												
	BEA	*U.C. per EA*			*40*	*$205.00*	*8200*	*0*	*0*	*0*	*0*	*8200*
	Rewrite TREAT radiation maintenance and operating documents		5.00	EA	200	NU/ENG	$41,000	$0	$0	$0	$0	$41,000
Memo:	Eight documents will have to be revised due to replacement of the TREAT Facility radiation monitoring system.											
	BEA	*U.C. per EA*			*24*	*$90.00*	*2160*	*0*	*0*	*0*	*0*	*2160*
	Health Physics review and comment		5.00	EA	120	HP	$10,800	$0	$0	$0	$0	$10,800
	BEA	*U.C. per EA*			*8*	*$90.00*	*720*	*0*	*0*	*0*	*0*	*720*
	Tech editor		5.00	EA	40	TECH/EDIT	$3,600	$0	$0	$0	$0	$3,600
	BEA	*U.C. per EA*		NM60	*21*	*$65.00*	*1365*	*0*	*1066*	*0*	*0*	*2431*
	Printing		1.00	EA	21	ADM	$1,365	$0	$1,066	$0	$0	$2,431

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code / Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
003 TREAT Radiation Monitoring System Main OPS												
	BEA	*U.C. per LS*			*1666*	*$120.00*	*199920*	*0*	*0*	*0*	*0*	*199920*
Project planning and scheduling			1.00	LS	1,666	PLANNER	$199,920	$0	$0	$0	$0	$199,920
Subtotal							$256,685	$0	$1,066	$0	$0	$257,751
Sales Tax							$0	$0	$64	$0	$0	$64
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$257,815**
Escalation							$33,497	$0	$147	$0	$0	$33,645
Management Reserve							$20,805	$0	$92	$0	$0	$20,897
---Total 003 TREAT Radiation Monitoring System Main OPS					**2,047**		**$310,987**	**$0**	**$1,369**	**$0**	**$0**	**$312,356**
TTR0001 Quality Assurance - Refurbishments and Upgrades A - OPC												
	BEA	*U.C. per EA*			*312*	*$130.00*	*40560*	*0*	*0*	*0*	*0*	*40560*
Inspection Plan Preparation			0.92	EA	287	QA/ENG	$37,315	$0	$0	$0	$0	$37,315
	BEA	*U.C. per EA*			*1716*	*$130.00*	*223080*	*0*	*0*	*0*	*0*	*223080*
INL Quality Engineer			0.92	EA	1,579	QA/ENG	$205,234	$0	$0	$0	$0	$205,234
	BEA	*U.C. per EA*			*1170*	*$130.00*	*152100*	*0*	*0*	*0*	*0*	*152100*
Inspection and Overview			0.92	EA	1,076	QA/ENG	$139,932	$0	$0	$0	$0	$139,932

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0001 Quality Assurance - Refurbishments and Upgrades A - OPC													
		BEA	*U.C. per EA*			*1560*	*$65.00*	*101400*	*0*	*0*	*0*	*0*	*101400*
	Maintain QA Doc. Admin Support			0.92	EA	1,435	ADM	$93,288	$0	$0	$0	$0	$93,288
	Subtotal							$475,769	$0	$0	$0	$0	$475,769
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$475,769**
	Escalation							$62,088	$0	$0	$0	$0	$62,088
	Management Reserve							$87,436	$0	$0	$0	$0	$87,436
---	**Total TTR0001 Quality Assurance - Refurbishments and Upgrades A - OPC**					**4,377**		**$625,292**	**$0**	**$0**	**$0**	**$0**	**$625,292**
TTR0001 Quality Assurance - Refurbishments and Upgrades B - CAP													
		BEA	*U.C. per EA*			*312*	*$130.00*	*40560*	*0*	*0*	*0*	*0*	*40560*
	Inspection Plan Preparation			0.08	EA	25	QA/ENG	$3,245	$0	$0	$0	$0	$3,245
		BEA	*U.C. per EA*			*1716*	*$130.00*	*223080*	*0*	*0*	*0*	*0*	*223080*
	INL Quality Engineer			0.08	EA	137	QA/ENG	$17,846	$0	$0	$0	$0	$17,846
		BEA	*U.C. per EA*			*1170*	*$130.00*	*152100*	*0*	*0*	*0*	*0*	*152100*
	Inspection and Overview			0.08	EA	94	QA/ENG	$12,168	$0	$0	$0	$0	$12,168

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0001 Quality Assurance - Refurbishments and Upgrades B - CAP												
	BEA	*U.C. per EA*			*1560*	*$65.00*	*101400*	*0*	*0*	*0*	*0*	*101400*
	Maintain QA Doc. Admin Support		0.08	EA	125	ADM	$8,112	$0	$0	$0	$0	$8,112
	Subtotal						$41,371	$0	$0	$0	$0	$41,371
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$41,371**
	Escalation						$5,399	$0	$0	$0	$0	$5,399
	Management Reserve						$7,603	$0	$0	$0	$0	$7,603
—Total	**TTR0001 Quality Assurance - Refurbishments and Upgrades B - CAP**				**381**		**$54,373**	**$0**	**$0**	**$0**	**$0**	**$54,373**
TTR0002 Enviromental Safety and Health Engineering A - OPC												
	BEA	*U.C. per EA*			*1560*	*$185.00*	*288600*	*0*	*0*	*0*	*0*	*288600*
	INL Enviromental Safety and Health Engineering		0.92	EA	1,435	ES&H	$265,512	$0	$0	$0	$0	$265,512
	Subtotal						$265,512	$0	$0	$0	$0	$265,512
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$265,512**
	Escalation						$34,649	$0	$0	$0	$0	$34,649
	Management Reserve						$49,628	$0	$0	$0	$0	$49,628
—Total	**TTR0002 Enviromental Safety and Health Engineering A - OPC**				**1,435**		**$349,789**	**$0**	**$0**	**$0**	**$0**	**$349,789**
TTR0002 Enviromental Safety and Health Engineering B - CAP												
	BEA	*U.C. per EA*			*1560*	*$185.00*	*288600*	*0*	*0*	*0*	*0*	*288600*
	INL Enviromental Safety and Health Engineering		0.08	EA	125	ES&H	$23,088	$0	$0	$0	$0	$23,088

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0002 Enviromental Safety and Health Engineering B - CAP												
	Subtotal						$23,088	$0	$0	$0	$0	$23,088
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$23,088**
	Escalation						$3,013	$0	$0	$0	$0	$3,013
	Management Reserve						$4,315	$0	$0	$0	$0	$4,315
---Total	**TTR0002 Enviromental Safety and Health Engineering B - CAP**				**125**		**$30,416**	**$0**	**$0**	**$0**	**$0**	**$30,416**
TTR0003 Radiological Controls A - OPC												
	BEA	*U.C. per EA*			*160*	*$90.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	INL Health Physics Technician (Full Time)		0.92	EA	147	HP	$13,248	$0	$0	$0	$0	$13,248
	BEA	*U.C. per EA*			*312*	*$90.00*	*28080*	*0*	*0*	*0*	*0*	*28080*
	INL Health Physics Supervisior Support		0.92	EA	287	HP	$25,834	$0	$0	$0	$0	$25,834
	BEA	*U.C. per EA*			*780*	*$145.00*	*113100*	*0*	*0*	*0*	*0*	*113100*
	INL Radiation Engineer		0.92	EA	718	RAD/ENG	$104,052	$0	$0	$0	$0	$104,052
	Subtotal						$143,134	$0	$0	$0	$0	$143,134
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$143,134**
	Escalation						$18,679	$0	$0	$0	$0	$18,679
	Management Reserve						$26,989	$0	$0	$0	$0	$26,989
---Total	**TTR0003 Radiological Controls A - OPC**				**1,152**		**$188,801**	**$0**	**$0**	**$0**	**$0**	**$188,801**
TTR0003 Radiological Controls B - CAP												
	BEA	*U.C. per EA*			*1560*	*$90.00*	*140400*	*0*	*0*	*0*	*0*	*140400*
	INL Health Physics Technician (Full Time)		0.08	EA	125	HP	$11,232	$0	$0	$0	$0	$11,232

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0003 Radiological Controls B - CAP													
	BEA	*U.C. per EA*				*312*	*$90.00*	*28080*	*0*	*0*	*0*	*0*	*28080*
	INL Health Physics Supervisior Support			0.08	EA	25	HP	$2,246	$0	$0	$0	$0	$2,246
	BEA	*U.C. per EA*				*780*	*$145.00*	*113100*	*0*	*0*	*0*	*0*	*113100*
	INL Radiation Engineer			0.08	EA	62	RAD/ENG	$9,048	$0	$0	$0	$0	$9,048
	Subtotal							$22,526	$0	$0	$0	$0	$22,526
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$22,526**
	Escalation							$2,940	$0	$0	$0	$0	$2,940
	Management Reserve							$4,247	$0	$0	$0	$0	$4,247
Total	**TTR0003 Radiological Controls B - CAP**					**212**		**$29,714**	**$0**	**$0**	**$0**	**$0**	**$29,714**
TTR0006 Documented Safety Analysis (DSA) Planning Document													
	BEA	*U.C. per LS*				*320*	*$205.00*	*65600*	*0*	*0*	*0*	*0*	*65600*
	Develop Planning Document			1.00	LS	320	NU/ENG	$65,600	$0	$0	$0	$0	$65,600
	Subtotal							$65,600	$0	$0	$0	$0	$65,600
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$65,600**
	Escalation							$8,561	$0	$0	$0	$0	$8,561
	Management Reserve							$12,385	$0	$0	$0	$0	$12,385
Total	**TTR0006 Documented Safety Analysis (DSA) Planning Document**					**320**		**$86,546**	**$0**	**$0**	**$0**	**$0**	**$86,546**

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 Revise Existing SAR Chapters												
	BEA	*U.C. per EA*			*160*	*$205.00*	*32800*	*0*	*0*	*0*	*0*	*32800*
	Update and revise each chapter of the DSA		21.00	EA	3,360	NU/ENG	$688,800	$0	$0	$0	$0	$688,800
	Memo: Assume 21 chapters to be rewritten at 4 weeks/chapter on average.											
	BEA	*U.C. per LS*			*320*	*$90.00*	*28800*	*0*	*0*	*0*	*0*	*28800*
	Tech editing		1.00	LS	320	TECH/EDIT	$28,800	$0	$0	$0	$0	$28,800
	BEA	*U.C. per LS*		NM60	*40*	*$65.00*	*2600*	*0*	*500*	*0*	*0*	*3100*
	Printing costs		1.00	LS	40	ADM	$2,600	$0	$500	$0	$0	$3,100
	BEA	*U.C. per LS*			*300*	*$205.00*	*61500*	*0*	*0*	*0*	*0*	*61500*
	Work station support documentation		1.00	LS	300	NU/ENG	$61,500	$0	$0	$0	$0	$61,500
	Subtotal						$781,700	$0	$500	$0	$0	$782,200
	Sales Tax						$0	$0	$30	$0	$0	$30
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$782,230**
	Escalation						$102,012	$0	$69	$0	$0	$102,081
	Management Reserve						$148,464	$0	$101	$0	$0	$148,564
—Total	**01 Revise Existing SAR Chapters**				**4,020**		**$1,032,175**	**$0**	**$700**	**$0**	**$0**	**$1,032,875**
02 Recalculate Dose Consequences												
	BEA	*U.C. per EA*			*160*	*$205.00*	*32800*	*0*	*0*	*0*	*0*	*32800*
	Develop and document source term envelope for dose calculations		1.00	EA	160	NU/ENG	$32,800	$0	$0	$0	$0	$32,800

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 Recalculate Dose Consequences													
	BEA	*U.C. per EA*				*160*	*$205.00*	*32800*	*0*	*0*	*0*	*0*	*32800*
	Perform calculations and document results			3.00	EA	480	NU/ENG	$98,400	$0	$0	$0	$0	$98,400
	Subtotal							$131,200	$0	$0	$0	$0	$131,200
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$131,200**
	Escalation							$17,122	$0	$0	$0	$0	$17,122
	Management Reserve							$24,223	$0	$0	$0	$0	$24,223
---Total 02 Recalculate Dose Consequences						**640**		**$172,544**	**$0**	**$0**	**$0**	**$0**	**$172,544**
03 Implementation of New DSA and New TSR													
	BEA	*U.C. per LS*				*500*	*$205.00*	*102500*	*0*	*0*	*0*	*0*	*102500*
	Implementation of the new DSA and TSR			1.00	LS	500	NU/ENG	$102,500	$0	$0	$0	$0	$102,500
	Subtotal							$102,500	$0	$0	$0	$0	$102,500
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$102,500**
	Escalation							$13,376	$0	$0	$0	$0	$13,376
	Management Reserve							$18,525	$0	$0	$0	$0	$18,525
---Total 03 Implementation of New DSA and New TSR						**500**		**$134,401**	**$0**	**$0**	**$0**	**$0**	**$134,401**
04 Analysis of Steady State Power													
	BEA	*U.C. per EA*				*240*	*$205.00*	*49200*	*0*	*0*	*0*	*0*	*49200*
	Analysis of a bounding reactivity insertion			1.00	EA	240	NU/ENG	$49,200	$0	$0	$0	$0	$49,200
	BEA	*U.C. per EA*				*240*	*$205.00*	*49200*	*0*	*0*	*0*	*0*	*49200*
	Analysis of complete loss of cooling at time of insertion			1.00	EA	240	NU/ENG	$49,200	$0	$0	$0	$0	$49,200

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
04 Analysis of Steady State Power													
	BEA	*U.C. per EA*				*240*	*$205.00*	*49200*	*0*	*0*	*0*	*0*	*49200*
	Bounding reactivity insertion assuming over loaded transient rod			1.00	EA	240	NU/ENG	$49,200	$0	$0	$0	$0	$49,200
	Subtotal							$147,600	$0	$0	$0	$0	$147,600
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$147,600**
	Escalation							$19,262	$0	$0	$0	$0	$19,262
	Management Reserve							$27,640	$0	$0	$0	$0	$27,640
---Total	**04 Analysis of Steady State Power**					**720**		**$194,502**	**$0**	**$0**	**$0**	**$0**	**$194,502**
05 Development of Engineering and Calc. Analysis Report													
	BEA	*U.C. per LS*				*360*	*$205.00*	*73800*	*0*	*0*	*0*	*0*	*73800*
	Development of engineering and calculation analysis report			1.00	LS	360	NU/ENG	$73,800	$0	$0	$0	$0	$73,800
	Subtotal							$73,800	$0	$0	$0	$0	$73,800
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$73,800**
	Escalation							$9,631	$0	$0	$0	$0	$9,631
	Management Reserve							$13,385	$0	$0	$0	$0	$13,385
---Total	**05 Development of Engineering and Calc. Analysis Report**					**360**		**$96,816**	**$0**	**$0**	**$0**	**$0**	**$96,816**
06 Hazard Assessment													
	BEA	*U.C. per LS*				*240*	*$205.00*	*49200*	*0*	*0*	*0*	*0*	*49200*
	Hazard assessment			1.00	LS	240	NU/ENG	$49,200	$0	$0	$0	$0	$49,200

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
06 Hazard Assessment												
	Subtotal						$49,200	$0	$0	$0	$0	$49,200
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$49,200**
	Escalation						$6,421	$0	$0	$0	$0	$6,421
	Management Reserve						$9,203	$0	$0	$0	$0	$9,203
---Total	**06 Hazard Assessment**				**240**		**$64,824**	**$0**	**$0**	**$0**	**$0**	**$64,824**
07 Confirmation and Documentation of SCRAM System												
	BEA	*U.C. per LS*			*160*	*$205.00*	*32800*	*0*	*0*	*0*	*0*	*32800*
	Confirmation and documentation of SCRAM System timing and worth of the SCRAM Sys		1.00	LS	160	NU/ENG	$32,800	$0	$0	$0	$0	$32,800
	Subtotal						$32,800	$0	$0	$0	$0	$32,800
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$32,800**
	Escalation						$4,280	$0	$0	$0	$0	$4,280
	Management Reserve						$5,970	$0	$0	$0	$0	$5,970
---Total	**07 Confirmation and Documentation of SCRAM System**				**160**		**$43,050**	**$0**	**$0**	**$0**	**$0**	**$43,050**
08 Confirmation and Documentation of Transient Rod												
	BEA	*U.C. per LS*			*160*	*$205.00*	*32800*	*0*	*0*	*0*	*0*	*32800*
	Confirmation and documentation on the response of the transient rod		1.00	LS	160	NU/ENG	$32,800	$0	$0	$0	$0	$32,800

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
08 Confirmation and Documentation of Transient Rod												
	Subtotal						$32,800	$0	$0	$0	$0	$32,800
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$32,800**
	Escalation						$4,280	$0	$0	$0	$0	$4,280
	Management Reserve						$6,192	$0	$0	$0	$0	$6,192
---Total	**08 Confirmation and Documentation of Transient Rod**				**160**		**$43,273**	**$0**	**$0**	**$0**	**$0**	**$43,273**
TTR0008 DSA Code Validation												
	BEA	*U.C. per EA*			*480*	*$205.00*	*98400*	*0*	*0*	*0*	*0*	*98400*
	Code to predict thermal response of an average core location		1.00	EA	480	NU/ENG	$98,400	$0	$0	$0	$0	$98,400
	BEA	*U.C. per EA*			*320*	*$205.00*	*65600*	*0*	*0*	*0*	*0*	*65600*
	Code to predict thermal response of the peak power location in the core		1.00	EA	320	NU/ENG	$65,600	$0	$0	$0	$0	$65,600
	BEA	*U.C. per EA*			*480*	*$205.00*	*98400*	*0*	*0*	*0*	*0*	*98400*
	Code to predict core power response to reactivity insertion		1.00	EA	480	NU/ENG	$98,400	$0	$0	$0	$0	$98,400
	BEA	*U.C. per EA*			*480*	*$205.00*	*98400*	*0*	*0*	*0*	*0*	*98400*
	Code to predict power distribution in core		1.00	EA	480	NU/ENG	$98,400	$0	$0	$0	$0	$98,400

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code / Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0008 DSA Code Validation												
	BEA	*U.C. per EA*			*160*	*$205.00*	*32800*	*0*	*0*	*0*	*0*	*32800*
Write ECAR			1.00	EA	160	NU/ENG	$32,800	$0	$0	$0	$0	$32,800
Subtotal							$393,600	$0	$0	$0	$0	$393,600
Sales Tax							$0	$0	$0	$0	$0	$0
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$393,600**
Escalation							$51,365	$0	$0	$0	$0	$51,365
Management Reserve							$70,787	$0	$0	$0	$0	$70,787
---Total TTR0008 DSA Code Validation					**1,920**		**$515,752**	**$0**	**$0**	**$0**	**$0**	**$515,752**
TTR0009 Technical Safety Requirements												
	BEA	*U.C. per LS*			*960*	*$205.00*	*196800*	*0*	*0*	*0*	*0*	*196800*
Rewrite TREAT technical specifications			1.00	LS	960	NU/ENG	$196,800	$0	$0	$0	$0	$196,800
	BEA	*U.C. per LS*			*300*	*$205.00*	*61500*	*0*	*0*	*0*	*0*	*61500*
Operations review and comment			1.00	LS	300	OPR/MGR	$61,500	$0	$0	$0	$0	$61,500
	BEA	*U.C. per LS*			*160*	*$90.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
Tech editor			1.00	LS	160	TECH/EDIT	$14,400	$0	$0	$0	$0	$14,400
Subtotal							$272,700	$0	$0	$0	$0	$272,700
Sales Tax							$0	$0	$0	$0	$0	$0
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$272,700**
Escalation							$35,587	$0	$0	$0	$0	$35,587
Management Reserve							$50,600	$0	$0	$0	$0	$50,600
---Total TTR0009 Technical Safety Requirements					**1,420**		**$358,887**	**$0**	**$0**	**$0**	**$0**	**$358,887**

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0010 Experiment Safety Analysis (ESA)												
	BEA	*U.C. per LS*			*320*	*$205.00*	*65600*	*0*	*0*	*0*	*0*	*65600*
	Write experiment safety analysis for first test		1.00	LS	320	NU/ENG	$65,600	$0	$0	$0	$0	$65,600
	BEA	*U.C. per LS*			*960*	*$205.00*	*196800*	*0*	*0*	*0*	*0*	*196800*
	Develop validated neutronics model of TREAT core		1.00	LS	960	NU/ENG	$196,800	$0	$0	$0	$0	$196,800
	BEA	*U.C. per LS*			*960*	*$205.00*	*196800*	*0*	*0*	*0*	*0*	*196800*
	Develop validated transient thermal hydraulic model of test		1.00	LS	960	NU/ENG	$196,800	$0	$0	$0	$0	$196,800
	BEA	*U.C. per LS*			*960*	*$205.00*	*196800*	*0*	*0*	*0*	*0*	*196800*
	Develop validated fuel pin energy disposition model		1.00	LS	960	NU/ENG	$196,800	$0	$0	$0	$0	$196,800
	Subtotal						$656,000	$0	$0	$0	$0	$656,000
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$656,000**
	Escalation						$85,608	$0	$0	$0	$0	$85,608
	Management Reserve						$123,412	$0	$0	$0	$0	$123,412
	Total TTR0010 Experiment Safety Analysis (ESA)				**3,200**		**$865,020**	**$0**	**$0**	**$0**	**$0**	**$865,020**
TTR0011 Fire Hazard Analysis (FHA)												
	BEA	*U.C. per LS*			*1300*	*$170.00*	*221000*	*0*	*0*	*0*	*0*	*221000*
	Review/rewrite existing FHA		1.00	LS	1,300	F-P/ENG	$221,000	$0	$0	$0	$0	$221,000
	BEA	*U.C. per LS*			*80*	*$170.00*	*13600*	*0*	*0*	*0*	*0*	*13600*
	Fire protection risk assessment		1.00	LS	80	F-P/ENG	$13,600	$0	$0	$0	$0	$13,600
	BEA	*U.C. per LS*			*100*	*$170.00*	*17000*	*0*	*0*	*0*	*0*	*17000*
	Documentation for NFPA compliance		1.00	LS	100	F-P/ENG	$17,000	$0	$0	$0	$0	$17,000
	BEA	*U.C. per LS*			*150*	*$170.00*	*25500*	*0*	*0*	*0*	*0*	*25500*
	FHA analysis 6 to 10 basic events		1.00	LS	150	F-P/ENG	$25,500	$0	$0	$0	$0	$25,500

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code / Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0011 Fire Hazard Analysis (FHA)												
	BEA	*U.C. per LS*			*20*	*$135.00*	*2700*	*0*	*0*	*0*	*0*	*2700*
Safety/Quality Engineer review			1.00	LS	20	SA/QA	$2,700	$0	$0	$0	$0	$2,700
	BEA	*U.C. per LS*			*80*	*$65.00*	*5200*	*0*	*0*	*0*	*0*	*5200*
Admin, Doc. control			1.00	LS	80	ADM	$5,200	$0	$0	$0	$0	$5,200
	BEA	*U.C. per LS*			*40*	*$90.00*	*3600*	*0*	*0*	*0*	*0*	*3600*
Tech Editor			1.00	LS	40	TECH/EDIT	$3,600	$0	$0	$0	$0	$3,600
	BEA	*U.C. per LS*		NM60			*0*	*0*	*1000*	*0*	*0*	*1000*
Printing			1.00	LS	0		$0	$0	$1,000	$0	$0	$1,000
Subtotal							$288,600	$0	$1,000	$0	$0	$289,600
Sales Tax							$0	$0	$60	$0	$0	$60
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$289,660**
Escalation							$37,662	$0	$138	$0	$0	$37,801
Management Reserve							$53,377	$0	$196	$0	$0	$53,573
Total TTR0011 Fire Hazard Analysis (FHA)					**1,770**		**$379,639**	**$0**	**$1,394**	**$0**	**$0**	**$381,033**
01 TREAT Operations												
	BEA	*U.C. per FTE*			*180*	*$193.54*	*34837.2*	*0*	*0*	*0*	*0*	*34837.2*
TREAT Mgr			1.00	FTE	180	Z03GB	$34,837	$0	$0	$0	$0	$34,837
	BEA	*U.C. per FTE*			*180*	*$193.54*	*34837.2*	*0*	*0*	*0*	*0*	*34837.2*
Supervisor			1.00	FTE	180	Z03GB	$34,837	$0	$0	$0	$0	$34,837
	BEA	*U.C. per FTE*			*180*	*$193.54*	*34837.2*	*0*	*0*	*0*	*0*	*34837.2*
Sr Reactor Operators			2.00	FTE	360	Z03GB	$69,674	$0	$0	$0	$0	$69,674
	BEA	*U.C. per FTE*			*180*	*$193.54*	*34837.2*	*0*	*0*	*0*	*0*	*34837.2*
SORC Chair			1.00	FTE	180	Z03GB	$34,837	$0	$0	$0	$0	$34,837

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
		BEA	*U.C. per FTE*			*180*	*$132.89*	*23920.2*	*0*	*0*	*0*	*0*	*23920.2*
	NFM			0.80	FTE	144	F01GB	$19,136	$0	$0	$0	$0	$19,136
		BEA	*U.C. per FTE*			*180*	*$141.77*	*25518.6*	*0*	*0*	*0*	*0*	*25518.6*
	Nuc Safety Analyst (Old SAR)			1.00	FTE	180	E63W4	$25,519	$0	$0	$0	$0	$25,519
		BEA	*U.C. per FTE*			*180*	*$151.24*	*27223.2*	*0*	*0*	*0*	*0*	*27223.2*
	ESS, USQ, SORC Member			0.80	FTE	144	E54W4	$21,779	$0	$0	$0	$0	$21,779
		BEA	*U.C. per FTE*			*180*	*$104.17*	*18750.6*	*0*	*0*	*0*	*0*	*18750.6*
	TREAT Operators			2.00	FTE	360	T05GB	$37,501	$0	$0	$0	$0	$37,501
		BEA	*U.C. per FTE*			*180*	*$151.24*	*27223.2*	*0*	*0*	*0*	*0*	*27223.2*
	System Engineers			3.50	FTE	630	E54W4	$95,281	$0	$0	$0	$0	$95,281
		BEA	*U.C. per FTE*			*180*	*$173.22*	*31179.6*	*0*	*0*	*0*	*0*	*31179.6*
	Facility Support Services Coordinator			0.10	FTE	18	Z02GB	$3,118	$0	$0	$0	$0	$3,118
		BEA	*U.C. per FTE*			*180*	*$151.78*	*27320.4*	*0*	*0*	*0*	*0*	*27320.4*
	ES&H Support			0.50	FTE	90	E19H1	$13,660	$0	$0	$0	$0	$13,660
		BEA	*U.C. per FTE*			*180*	*$108.76*	*19576.8*	*0*	*0*	*0*	*0*	*19576.8*
	Radcon Support			1.00	FTE	180	T13H6	$19,577	$0	$0	$0	$0	$19,577
		BEA	*U.C. per FTE*			*180*	*$67.92*	*12225.6*	*0*	*0*	*0*	*0*	*12225.6*
	Admin Support			1.00	FTE	180	A20GB	$12,226	$0	$0	$0	$0	$12,226
		BEA	*U.C. per FTE*			*180*	*$67.92*	*12225.6*	*0*	*0*	*0*	*0*	*12225.6*
	Document Writers			2.00	FTE	360	A20GB	$24,451	$0	$0	$0	$0	$24,451
		BEA	*U.C. per FTE*			*180*	*$111.20*	*20016*	*0*	*0*	*0*	*0*	*20016*
	Doc Editors, Procedures, TSR			2.00	FTE	360	P19GB	$40,032	$0	$0	$0	$0	$40,032
		BEA	*U.C. per FTE*			*180*	*$87.36*	*15724.8*	*0*	*0*	*0*	*0*	*15724.8*
	Drafting			1.00	FTE	180	T03W1	$15,725	$0	$0	$0	$0	$15,725
		BEA	*U.C. per FTE*			*180*	*$99.49*	*17908.2*	*0*	*0*	*0*	*0*	*17908.2*
	PFC			0.50	FTE	90	P44F2	$8,954	$0	$0	$0	$0	$8,954

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
	Trainer	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$111.30* P23GB	*20034* $20,034	*0* $0	*0* $0	*0* $0	*0* $0	*20034* $20,034
	Security	BEA	*U.C. per FTE*	0.01	FTE	*180* 2	*$70.61* U59M4	*12710* $127	*0* $0	*0* $0	*0* $0	*0* $0	*12710* $127
	Consultants, Services Subcontracts, Advisory Panel	BEA	*U.C. per Allow*	2.00	Allow	0		*0* $0	*0* $0	*0* $0	*20000* $40,000	*0* $0	*20000* $40,000
	Travel - Nominal amount	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*2000* $2,000	*0* $0	*0* $0	*2000* $2,000
	Business materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*7500* $7,500	*0* $0	*0* $0	*7500* $7,500
	Maintenance Parts Supplies	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*7500* $7,500	*0* $0	*0* $0	*7500* $7,500
	Subtotal							$531,305	$0	$17,000	$40,000	$0	$588,305
	Sales Tax							$0	$0	$1,020	$0	$0	$1,020
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$589,325**
	Escalation							$69,335	$0	$2,352	$5,220	$0	$76,907
	Management Reserve							$0	$0	$0	$0	$0	$0
	---Total 01 TREAT Operations					**3,998**		**$600,641**	**$0**	**$20,372**	**$45,220**	**$0**	**$666,232**
02 TREAT Maintenance (CM, PM, Deffered)													
	TREAT Maint Supervisor	BEA	*U.C. per FTE*	0.01	FTE	*180* 2	*$193.54* Z03GB	*34837* $348	*0* $0	*0* $0	*0* $0	*0* $0	*34837* $348
	Wrk Pkg Planners	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$132.89* F01GB	*23920.2* $47,840	*0* $0	*0* $0	*0* $0	*0* $0	*23920.2* $47,840

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
	Maint Coordinator	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$173.22* Z02GB	*31179.6* $15,590	*0* $0	*0* $0	*0* $0	*0* $0	*31179.6* $15,590
	admin Support	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$67.92* A20GB	*12225.6* $6,113	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $6,113
	Document Writer	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$67.92* A20GB	*12225.6* $12,226	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $12,226
	Electronics Tech	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$107.33* T04J1	*19319.4* $9,660	*0* $0	*0* $0	*0* $0	*0* $0	*19319.4* $9,660
	Electrician	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$87.60* U11GB	*15768* $7,884	*0* $0	*0* $0	*0* $0	*0* $0	*15768* $7,884
	Mechanic, Welder	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$87.78* U29GB	*15800.4* $7,900	*0* $0	*0* $0	*0* $0	*0* $0	*15800.4* $7,900
	Heavy Equipment - cranes	BEA	*U.C. per FTE*	0.20	FTE	*180* 36	*$87.44* U71GB	*15739.2* $3,148	*0* $0	*0* $0	*0* $0	*0* $0	*15739.2* $3,148
	Services Subcontracts	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*0* $0	*10000* $10,000	*0* $0	*10000* $10,000
	Maintenance materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*7500* $7,500	*0* $0	*0* $0	*7500* $7,500

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code / Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)												
Maintenance system Parts, Equipment	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*15000* $15,000	*0* $0	*0* $0	*15000* $15,000
Subtotal							$110,709	$0	$22,500	$10,000	$0	$143,209
Sales Tax							$0	$0	$1,350	$0	$0	$1,350
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$144,559**
Escalation							$14,447	$0	$3,112	$1,305	$0	$18,865
Management Reserve							$0	$0	$0	$0	$0	$0
---Total 02 TREAT Maintenance (CM, PM, Deffered)					**1,028**		**$125,156**	**$0**	**$26,962**	**$11,305**	**$0**	**$163,424**
01 TREAT Operations												
TREAT Mgr	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$193.54* Z03GB	*34837.2* $34,837	*0* $0	*0* $0	*0* $0	*0* $0	*34837.2* $34,837
Supervisor	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$193.54* Z03GB	*34837.2* $34,837	*0* $0	*0* $0	*0* $0	*0* $0	*34837.2* $34,837
Sr Reactor Operators	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$193.54* Z03GB	*34837.2* $69,674	*0* $0	*0* $0	*0* $0	*0* $0	*34837.2* $69,674
SORC Chair	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$193.54* Z03GB	*34837.2* $34,837	*0* $0	*0* $0	*0* $0	*0* $0	*34837.2* $34,837
NFM	BEA	*U.C. per FTE*	0.80	FTE	*180* 144	*$132.89* F01GB	*23920.2* $19,136	*0* $0	*0* $0	*0* $0	*0* $0	*23920.2* $19,136
Nuc Safety Analyst (Old SAR)	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$141.77* E63W4	*25518.6* $25,519	*0* $0	*0* $0	*0* $0	*0* $0	*25518.6* $25,519
ESS, USQ, SORC Member	BEA	*U.C. per FTE*	0.80	FTE	*180* 144	*$151.24* E54W4	*27223.2* $21,779	*0* $0	*0* $0	*0* $0	*0* $0	*27223.2* $21,779

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
		BEA	*U.C. per FTE*			*180*	*$104.17*	*18750.6*	*0*	*0*	*0*	*0*	*18750.6*
	TREAT Operators			2.00	FTE	360	T05GB	$37,501	$0	$0	$0	$0	$37,501
		BEA	*U.C. per FTE*			*180*	*$151.24*	*27223.2*	*0*	*0*	*0*	*0*	*27223.2*
	System Engineers			3.50	FTE	630	E54W4	$95,281	$0	$0	$0	$0	$95,281
		BEA	*U.C. per FTE*			*180*	*$173.22*	*31179.6*	*0*	*0*	*0*	*0*	*31179.6*
	Facility Support Services Coordinator			0.10	FTE	18	Z02GB	$3,118	$0	$0	$0	$0	$3,118
		BEA	*U.C. per FTE*			*180*	*$151.78*	*27320.4*	*0*	*0*	*0*	*0*	*27320.4*
	ES&H Support			0.50	FTE	90	E19H1	$13,660	$0	$0	$0	$0	$13,660
		BEA	*U.C. per FTE*			*180*	*$108.76*	*19576.8*	*0*	*0*	*0*	*0*	*19576.8*
	Radcon Support			1.00	FTE	180	T13H6	$19,577	$0	$0	$0	$0	$19,577
		BEA	*U.C. per FTE*			*180*	*$67.92*	*12225.6*	*0*	*0*	*0*	*0*	*12225.6*
	Admin Support			1.00	FTE	180	A20GB	$12,226	$0	$0	$0	$0	$12,226
		BEA	*U.C. per FTE*			*180*	*$67.92*	*12225.6*	*0*	*0*	*0*	*0*	*12225.6*
	Document Writers			2.00	FTE	360	A20GB	$24,451	$0	$0	$0	$0	$24,451
		BEA	*U.C. per FTE*			*180*	*$111.20*	*20016*	*0*	*0*	*0*	*0*	*20016*
	Doc Editors, Procedures, TSR			2.00	FTE	360	P19GB	$40,032	$0	$0	$0	$0	$40,032
		BEA	*U.C. per FTE*			*180*	*$87.36*	*15724.8*	*0*	*0*	*0*	*0*	*15724.8*
	Drafting			1.00	FTE	180	T03W1	$15,725	$0	$0	$0	$0	$15,725
		BEA	*U.C. per FTE*			*180*	*$99.49*	*17908.2*	*0*	*0*	*0*	*0*	*17908.2*
	PFC			0.50	FTE	90	P44F2	$8,954	$0	$0	$0	$0	$8,954
		BEA	*U.C. per FTE*			*180*	*$111.30*	*20034*	*0*	*0*	*0*	*0*	*20034*
	Trainer			1.00	FTE	180	P23GB	$20,034	$0	$0	$0	$0	$20,034
		BEA	*U.C. per FTE*			*180*	*$70.61*	*12710*	*0*	*0*	*0*	*0*	*12710*
	Security			0.01	FTE	2	U59M4	$127	$0	$0	$0	$0	$127
		BEA	*U.C. per Allow*					*0*	*0*	*0*	*20000*	*0*	*20000*
	Consultants, Services Subcontracts, Advisory Panel			2.00	Allow	0		$0	$0	$0	$40,000	$0	$40,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
	Travel - Nominal amount	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*2000* $2,000	*0* $0	*0* $0	*2000* $2,000
	Business materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*7500* $7,500	*0* $0	*0* $0	*7500* $7,500
	Maintenance Parts Supplies	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*7500* $7,500	*0* $0	*0* $0	*7500* $7,500
	Subtotal							$531,305	$0	$17,000	$40,000	$0	$588,305
	Sales Tax							$0	$0	$1,020	$0	$0	$1,020
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$589,325**
	Escalation							$69,335	$0	$2,352	$5,220	$0	$76,907
	Management Reserve							$0	$0	$0	$0	$0	$0
Total 01 TREAT Operations						**3,998**		**$600,641**	**$0**	**$20,372**	**$45,220**	**$0**	**$666,232**
02 TREAT Maintenance (CM, PM, Deffered)													
	TREAT Maint Supervisor	BEA	*U.C. per FTE*	0.01	FTE	*180* 2	*$193.54* Z03GB	*34837* $348	*0* $0	*0* $0	*0* $0	*0* $0	*34837* $348
	Wrk Pkg Planners	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$132.89* F01GB	*23920.2* $47,840	*0* $0	*0* $0	*0* $0	*0* $0	*23920.2* $47,840
	Maint Coordinator	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$173.22* Z02GB	*31179.6* $15,590	*0* $0	*0* $0	*0* $0	*0* $0	*31179.6* $15,590
	admin Support	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$67.92* A20GB	*12225.6* $6,113	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $6,113
	Document Writer	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$67.92* A20GB	*12225.6* $12,226	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $12,226

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
		BEA	*U.C. per FTE*			*180*	*$107.33*	*19319.4*	*0*	*0*	*0*	*0*	*19319.4*
	Electronics Tech			0.50	FTE	90	T04J1	$9,660	$0	$0	$0	$0	$9,660
		BEA	*U.C. per FTE*			*180*	*$87.60*	*15768*	*0*	*0*	*0*	*0*	*15768*
	Electrician			0.50	FTE	90	U11GB	$7,884	$0	$0	$0	$0	$7,884
		BEA	*U.C. per FTE*			*180*	*$87.78*	*15800.4*	*0*	*0*	*0*	*0*	*15800.4*
	Mechanic, Welder			0.50	FTE	90	U29GB	$7,900	$0	$0	$0	$0	$7,900
		BEA	*U.C. per FTE*			*180*	*$87.44*	*15739.2*	*0*	*0*	*0*	*0*	*15739.2*
	Heavy Equipment - cranes			0.20	FTE	36	U71GB	$3,148	$0	$0	$0	$0	$3,148
		BEA	*U.C. per Allow*					*0*	*0*	*0*	*10000*	*0*	*10000*
	Services Subcontracts			1.00	Allow	0		$0	$0	$0	$10,000	$0	$10,000
		BEA	*U.C. per Allow*					*0*	*0*	*7500*	*0*	*0*	*7500*
	Maintenance materials			1.00	Allow	0		$0	$0	$7,500	$0	$0	$7,500
		BEA	*U.C. per Allow*					*0*	*0*	*15000*	*0*	*0*	*15000*
	Maintenance system Parts, Equipment			1.00	Allow	0		$0	$0	$15,000	$0	$0	$15,000
	Subtotal							$110,709	$0	$22,500	$10,000	$0	$143,209
	Sales Tax							$0	$0	$1,350	$0	$0	$1,350
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$144,559**
	Escalation							$14,447	$0	$3,112	$1,305	$0	$18,865
	Management Reserve							$0	$0	$0	$0	$0	$0
—Total 02 TREAT Maintenance (CM, PM, Deffered)						**1,028**		**$125,156**	**$0**	**$26,962**	**$11,305**	**$0**	**$163,424**
01 TREAT Operations													
		BEA	*U.C. per FTE*			*450*	*$70.61*	*31775*	*0*	*0*	*0*	*0*	*31775*
	Security			0.01	FTE	5	U59M4	$318	$0	$0	$0	$0	$318

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
		BEA	*U.C. per FTE*			*450*	*$173.22*	*77949*	*0*	*0*	*0*	*0*	*77949*
	Facility Support Services Coordinator			0.10	FTE	45	Z02GB	$7,795	$0	$0	$0	$0	$7,795
		BEA	*U.C. per FTE*			*450*	*$151.78*	*68301*	*0*	*0*	*0*	*0*	*68301*
	ES&H Support			0.50	FTE	225	E19H1	$34,151	$0	$0	$0	$0	$34,151
		BEA	*U.C. per FTE*			*450*	*$99.49*	*44770.5*	*0*	*0*	*0*	*0*	*44770.5*
	PFC			0.50	FTE	225	P44F2	$22,385	$0	$0	$0	$0	$22,385
		BEA	*U.C. per FTE*			*450*	*$132.89*	*59800.5*	*0*	*0*	*0*	*0*	*59800.5*
	NFM			0.80	FTE	360	F01GB	$47,840	$0	$0	$0	$0	$47,840
		BEA	*U.C. per FTE*			*450*	*$151.24*	*68058*	*0*	*0*	*0*	*0*	*68058*
	ESS, USQ, SORC Member			0.80	FTE	360	E54W4	$54,446	$0	$0	$0	$0	$54,446
		BEA	*U.C. per FTE*			*450*	*$193.54*	*87093*	*0*	*0*	*0*	*0*	*87093*
	TREAT Mgr			1.00	FTE	450	Z03GB	$87,093	$0	$0	$0	$0	$87,093
		BEA	*U.C. per FTE*			*450*	*$193.54*	*87093*	*0*	*0*	*0*	*0*	*87093*
	Supervisor			1.00	FTE	450	Z03GB	$87,093	$0	$0	$0	$0	$87,093
		BEA	*U.C. per FTE*			*450*	*$193.54*	*87093*	*0*	*0*	*0*	*0*	*87093*
	SORC Chair			1.00	FTE	450	Z03GB	$87,093	$0	$0	$0	$0	$87,093
		BEA	*U.C. per FTE*			*450*	*$141.77*	*63796.5*	*0*	*0*	*0*	*0*	*63796.5*
	Nuc Safety Analyst (Old SAR)			1.00	FTE	450	E63W4	$63,797	$0	$0	$0	$0	$63,797
		BEA	*U.C. per FTE*			*450*	*$108.76*	*48942*	*0*	*0*	*0*	*0*	*48942*
	Radcon Support			1.00	FTE	450	T13H6	$48,942	$0	$0	$0	$0	$48,942
		BEA	*U.C. per FTE*			*450*	*$67.92*	*30564*	*0*	*0*	*0*	*0*	*30564*
	Admin Support			1.00	FTE	450	A20GB	$30,564	$0	$0	$0	$0	$30,564
		BEA	*U.C. per FTE*			*450*	*$87.36*	*39312*	*0*	*0*	*0*	*0*	*39312*
	Drafting			1.00	FTE	450	T03W1	$39,312	$0	$0	$0	$0	$39,312
		BEA	*U.C. per FTE*			*450*	*$111.30*	*50085*	*0*	*0*	*0*	*0*	*50085*
	Trainer			1.00	FTE	450	P23GB	$50,085	$0	$0	$0	$0	$50,085

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
	Travel - Nominal amount	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*5000* $5,000	*0* $0	*0* $0	*5000* $5,000
	Business materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*18750* $18,750	*0* $0	*0* $0	*18750* $18,750
	Maintenance Parts Supplies	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*18750* $18,750	*0* $0	*0* $0	*18750* $18,750
	Sr Reactor Operators	BEA	*U.C. per FTE*	2.00	FTE	*450* 900	*$193.54* Z03GB	*87093* $174,186	*0* $0	*0* $0	*0* $0	*0* $0	*87093* $174,186
	TREAT Operators	BEA	*U.C. per FTE*	2.00	FTE	*450* 900	*$104.17* T05GB	*46876.5* $93,753	*0* $0	*0* $0	*0* $0	*0* $0	*46876.5* $93,753
	Document Writers	BEA	*U.C. per FTE*	2.00	FTE	*450* 900	*$67.92* A20GB	*30564* $61,128	*0* $0	*0* $0	*0* $0	*0* $0	*30564* $61,128
	Doc Editors, Procedures, TSR	BEA	*U.C. per FTE*	2.00	FTE	*450* 900	*$111.20* P19GB	*50040* $100,080	*0* $0	*0* $0	*0* $0	*0* $0	*50040* $100,080
	Consultants, Services Subcontracts, Advisory Panel	BEA	*U.C. per Allow*	2.00	Allow	0		*0* $0	*0* $0	*0* $0	*50000* $100,000	*0* $0	*50000* $100,000
	System Engineers	BEA	*U.C. per FTE*	3.50	FTE	*450* 1,575	*$151.24* E54W4	*68058* $238,203	*0* $0	*0* $0	*0* $0	*0* $0	*68058* $238,203
	Subtotal							$1,328,264	$0	$42,500	$100,000	$0	$1,470,764
	Sales Tax							$0	$0	$2,550	$0	$0	$2,550
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$1,473,314**
	Escalation							$173,338	$0	$5,879	$13,050	$0	$192,267
	Management Reserve							$0	$0	$0	$0	$0	$0
	---Total 01 TREAT Operations					**9,995**		**$1,501,602**	**$0**	**$50,929**	**$113,050**	**$0**	**$1,665,581**

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
	TREAT Maint Supervisor	BEA	*U.C. per FTE*	0.01	FTE	*450* 5	*$193.54* Z03GB	*87093* $871	*0* $0	*0* $0	*0* $0	*0* $0	*87093* $871
	Heavy Equipment - cranes	BEA	*U.C. per FTE*	0.20	FTE	*450* 90	*$87.44* U71GB	*39348* $7,870	*0* $0	*0* $0	*0* $0	*0* $0	*39348* $7,870
	Maint Coordinator	BEA	*U.C. per FTE*	0.50	FTE	*450* 225	*$173.22* Z02GB	*77949* $38,975	*0* $0	*0* $0	*0* $0	*0* $0	*77949* $38,975
	admin Support	BEA	*U.C. per FTE*	0.50	FTE	*450* 225	*$67.92* A20GB	*30564* $15,282	*0* $0	*0* $0	*0* $0	*0* $0	*30564* $15,282
	Electronics Tech	BEA	*U.C. per FTE*	0.50	FTE	*450* 225	*$107.33* T04J1	*48298.5* $24,149	*0* $0	*0* $0	*0* $0	*0* $0	*48298.5* $24,149
	Electrician	BEA	*U.C. per FTE*	0.50	FTE	*450* 225	*$87.60* U11GB	*39420* $19,710	*0* $0	*0* $0	*0* $0	*0* $0	*39420* $19,710
	Mechanic, Welder	BEA	*U.C. per FTE*	0.50	FTE	*450* 225	*$87.78* U29GB	*39501* $19,751	*0* $0	*0* $0	*0* $0	*0* $0	*39501* $19,751
	Document Writer	BEA	*U.C. per FTE*	1.00	FTE	*450* 450	*$67.92* A20GB	*30564* $30,564	*0* $0	*0* $0	*0* $0	*0* $0	*30564* $30,564
	Services Subcontracts	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*0* $0	*25000* $25,000	*0* $0	*25000* $25,000
	Maintenance materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*18750* $18,750	*0* $0	*0* $0	*18750* $18,750
	Maintenance system Parts, Equipment	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*37500* $37,500	*0* $0	*0* $0	*37500* $37,500

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
		BEA	*U.C. per FTE*			*450*	*$132.89*	*59800.5*	*0*	*0*	*0*	*0*	*59800.5*
	Wrk Pkg Planners			2.00	FTE	900	F01GB	$119,601	$0	$0	$0	$0	$119,601
	Subtotal							$276,772	$0	$56,250	$25,000	$0	$358,022
	Sales Tax							$0	$0	$3,375	$0	$0	$3,375
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$361,397**
	Escalation							$36,119	$0	$7,781	$3,263	$0	$47,162
	Management Reserve							$0	$0	$0	$0	$0	$0
—Total	**02 TREAT Maintenance (CM, PM, Deffered)**					**2,570**		**$312,890**	**$0**	**$67,406**	**$28,263**	**$0**	**$408,559**
01 TREAT Operations													
		BEA	*U.C. per FTE*			*720*	*$70.61*	*50839*	*0*	*0*	*0*	*0*	*50839*
	Security			0.01	FTE	7	U59M4	$508	$0	$0	$0	$0	$508
		BEA	*U.C. per FTE*			*720*	*$173.22*	*124718.4*	*0*	*0*	*0*	*0*	*124718.4*
	Facility Support Services Coordinator			0.10	FTE	72	Z02GB	$12,472	$0	$0	$0	$0	$12,472
		BEA	*U.C. per FTE*			*720*	*$151.78*	*109281.6*	*0*	*0*	*0*	*0*	*109281.6*
	ES&H Support			0.50	FTE	360	E19H1	$54,641	$0	$0	$0	$0	$54,641
		BEA	*U.C. per FTE*			*720*	*$99.49*	*71632.8*	*0*	*0*	*0*	*0*	*71632.8*
	PFC			0.50	FTE	360	P44F2	$35,816	$0	$0	$0	$0	$35,816
		BEA	*U.C. per FTE*			*720*	*$132.89*	*95680.8*	*0*	*0*	*0*	*0*	*95680.8*
	NFM			0.80	FTE	576	F01GB	$76,545	$0	$0	$0	$0	$76,545
		BEA	*U.C. per FTE*			*720*	*$151.24*	*108892.8*	*0*	*0*	*0*	*0*	*108892.8*
	ESS, USQ, SORC Member			0.80	FTE	576	E54W4	$87,114	$0	$0	$0	$0	$87,114
		BEA	*U.C. per FTE*			*720*	*$193.54*	*139348.8*	*0*	*0*	*0*	*0*	*139348.8*
	TREAT Mgr			1.00	FTE	720	Z03GB	$139,349	$0	$0	$0	$0	$139,349

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
	Supervisor	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$193.54* Z03GB	*139348.8* $139,349	*0* $0	*0* $0	*0* $0	*0* $0	*139348.8* $139,349
	SORC Chair	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$193.54* Z03GB	*139348.8* $139,349	*0* $0	*0* $0	*0* $0	*0* $0	*139348.8* $139,349
	Nuc Safety Analyst (Old SAR)	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$141.77* E63W4	*102074.4* $102,074	*0* $0	*0* $0	*0* $0	*0* $0	*102074.4* $102,074
	Radcon Support	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$108.76* T13H6	*78307.2* $78,307	*0* $0	*0* $0	*0* $0	*0* $0	*78307.2* $78,307
	Admin Support	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$67.92* A20GB	*48902.4* $48,902	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $48,902
	Drafting	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$87.36* T03W1	*62899.2* $62,899	*0* $0	*0* $0	*0* $0	*0* $0	*62899.2* $62,899
	Trainer	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$111.30* P23GB	*80136* $80,136	*0* $0	*0* $0	*0* $0	*0* $0	*80136* $80,136
	Travel - Nominal amount	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*8000* $8,000	*0* $0	*0* $0	*8000* $8,000
	Business materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Maintenance Parts Supplies	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Sr Reactor Operators	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$193.54* Z03GB	*139348.8* $278,698	*0* $0	*0* $0	*0* $0	*0* $0	*139348.8* $278,698
	TREAT Operators	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$104.17* T05GB	*75002.4* $150,005	*0* $0	*0* $0	*0* $0	*0* $0	*75002.4* $150,005
	Document Writers	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$67.92* A20GB	*48902.4* $97,805	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $97,805

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
		BEA	*U.C. per FTE*			*720*	*$111.20*	*80064*	*0*	*0*	*0*	*0*	*80064*
	Doc Editors, Procedures, TSR			2.00	FTE	1,440	P19GB	$160,128	$0	$0	$0	$0	$160,128
		BEA	*U.C. per Allow*					*0*	*0*	*0*	*80000*	*0*	*80000*
	Consultants, Services Subcontracts, Advisory Panel			2.00	Allow	0		$0	$0	$0	$160,000	$0	$160,000
		BEA	*U.C. per FTE*			*720*	*$151.24*	*108892.8*	*0*	*0*	*0*	*0*	*108892.8*
	System Engineers			3.50	FTE	2,520	E54W4	$381,125	$0	$0	$0	$0	$381,125
	Subtotal							$2,125,222	$0	$68,000	$160,000	$0	$2,353,222
	Sales Tax							$0	$0	$4,080	$0	$0	$4,080
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$2,357,302**
	Escalation							$277,341	$0	$9,406	$20,880	$0	$307,628
	Management Reserve							$0	$0	$0	$0	$0	$0
---Total 01 TREAT Operations						**15,991**		**$2,402,563**	**$0**	**$81,486**	**$180,880**	**$0**	**$2,664,930**
02 TREAT Maintenance (CM, PM, Deffered)													
		BEA	*U.C. per FTE*			*720*	*$193.54*	*139349*	*0*	*0*	*0*	*0*	*139349*
	TREAT Maint Supervisor			0.01	FTE	7	Z03GB	$1,393	$0	$0	$0	$0	$1,393
		BEA	*U.C. per FTE*			*720*	*$87.44*	*62956.8*	*0*	*0*	*0*	*0*	*62956.8*
	Heavy Equipment - cranes			0.20	FTE	144	U71GB	$12,591	$0	$0	$0	$0	$12,591
		BEA	*U.C. per FTE*			*720*	*$173.22*	*124718.4*	*0*	*0*	*0*	*0*	*124718.4*
	Maint Coordinator			0.50	FTE	360	Z02GB	$62,359	$0	$0	$0	$0	$62,359
		BEA	*U.C. per FTE*			*720*	*$67.92*	*48902.4*	*0*	*0*	*0*	*0*	*48902.4*
	admin Support			0.50	FTE	360	A20GB	$24,451	$0	$0	$0	$0	$24,451
		BEA	*U.C. per FTE*			*720*	*$107.33*	*77277.6*	*0*	*0*	*0*	*0*	*77277.6*
	Electronics Tech			0.50	FTE	360	T04J1	$38,639	$0	$0	$0	$0	$38,639

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
	Electrician	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$87.60* U11GB	*63072* $31,536	*0* $0	*0* $0	*0* $0	*0* $0	*63072* $31,536
	Mechanic, Welder	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$87.78* U29GB	*63201.6* $31,601	*0* $0	*0* $0	*0* $0	*0* $0	*63201.6* $31,601
	Document Writer	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$67.92* A20GB	*48902.4* $48,902	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $48,902
	Services Subcontracts	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*0* $0	*40000* $40,000	*0* $0	*40000* $40,000
	Maintenance materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Maintenance system Parts, Equipment	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*60000* $60,000	*0* $0	*0* $0	*60000* $60,000
	Wrk Pkg Planners	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$132.89* F01GB	*95680.8* $191,362	*0* $0	*0* $0	*0* $0	*0* $0	*95680.8* $191,362
	Subtotal							$442,835	$0	$90,000	$40,000	$0	$572,835
	Sales Tax							$0	$0	$5,400	$0	$0	$5,400
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$578,235**
	Escalation							$57,790	$0	$12,450	$5,220	$0	$75,460
	Management Reserve							$0	$0	$0	$0	$0	$0
---Total 02 TREAT Maintenance (CM, PM, Deffered)						**4,111**		**$500,625**	**$0**	**$107,850**	**$45,220**	**$0**	**$653,694**
01 Contractor Readiness Preparation and Execution													
	Security	BEA	*U.C. per FTE*	0.01	FTE	*720* 7	*$70.61* U59M4	*50839* $508	*0* $0	*0* $0	*0* $0	*0* $0	*50839* $508

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 Contractor Readiness Preparation and Execution												
		BEA U.C. per FTE			*720*	*$173.22*	*124718.4*	*0*	*0*	*0*	*0*	*124718.4*
	Facility Support Services Coordinator		0.10	FTE	72	Z02GB	$12,472	$0	$0	$0	$0	$12,472
		BEA U.C. per FTE			*720*	*$151.78*	*109281.6*	*0*	*0*	*0*	*0*	*109281.6*
	ES&H Support		0.50	FTE	360	E19H1	$54,641	$0	$0	$0	$0	$54,641
		BEA U.C. per FTE			*720*	*$99.49*	*71632.8*	*0*	*0*	*0*	*0*	*71632.8*
	PFC		0.50	FTE	360	P44F2	$35,816	$0	$0	$0	$0	$35,816
		BEA U.C. per FTE			*720*	*$132.89*	*95680.8*	*0*	*0*	*0*	*0*	*95680.8*
	NFM		0.80	FTE	576	F01GB	$76,545	$0	$0	$0	$0	$76,545
		BEA U.C. per FTE			*720*	*$151.24*	*108892.8*	*0*	*0*	*0*	*0*	*108892.8*
	ESS, USQ, SORC Member		0.80	FTE	576	E54W4	$87,114	$0	$0	$0	$0	$87,114
		BEA U.C. per FTE			*720*	*$193.54*	*139348.8*	*0*	*0*	*0*	*0*	*139348.8*
	TREAT Mgr		1.00	FTE	720	Z03GB	$139,349	$0	$0	$0	$0	$139,349
		BEA U.C. per FTE			*720*	*$193.54*	*139348.8*	*0*	*0*	*0*	*0*	*139348.8*
	Supervisor		1.00	FTE	720	Z03GB	$139,349	$0	$0	$0	$0	$139,349
		BEA U.C. per FTE			*720*	*$193.54*	*139348.8*	*0*	*0*	*0*	*0*	*139348.8*
	SORC Chair		1.00	FTE	720	Z03GB	$139,349	$0	$0	$0	$0	$139,349
		BEA U.C. per FTE			*720*	*$141.77*	*102074.4*	*0*	*0*	*0*	*0*	*102074.4*
	Nuc Safety Analyst (Old SAR)		1.00	FTE	720	E63W4	$102,074	$0	$0	$0	$0	$102,074
		BEA U.C. per FTE			*720*	*$108.76*	*78307.2*	*0*	*0*	*0*	*0*	*78307.2*
	Radcon Support		1.00	FTE	720	T13H6	$78,307	$0	$0	$0	$0	$78,307
		BEA U.C. per FTE			*720*	*$67.92*	*48902.4*	*0*	*0*	*0*	*0*	*48902.4*
	Admin Support		1.00	FTE	720	A20GB	$48,902	$0	$0	$0	$0	$48,902
		BEA U.C. per FTE			*720*	*$87.36*	*62899.2*	*0*	*0*	*0*	*0*	*62899.2*
	Drafting		1.00	FTE	720	T03W1	$62,899	$0	$0	$0	$0	$62,899
		BEA U.C. per FTE			*720*	*$111.30*	*80136*	*0*	*0*	*0*	*0*	*80136*
	Trainer		1.00	FTE	720	P23GB	$80,136	$0	$0	$0	$0	$80,136

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 Contractor Readiness Preparation and Execution													
	Travel - Nominal amount	BEA	U.C. per Allow	1.00	Allow	0		*0* $0	*0* $0	*8000* $8,000	*0* $0	*0* $0	*8000* $8,000
	Business materials	BEA	U.C. per Allow	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Maintenance Parts Supplies	BEA	U.C. per Allow	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Sr Reactor Operators	BEA	U.C. per FTE	2.00	FTE	*720* 1,440	*$193.54* Z03GB	*139348.8* $278,698	*0* $0	*0* $0	*0* $0	*0* $0	*139348.8* $278,698
	TREAT Operators	BEA	U.C. per FTE	2.00	FTE	*720* 1,440	*$104.17* T05GB	*75002.4* $150,005	*0* $0	*0* $0	*0* $0	*0* $0	*75002.4* $150,005
	Document Writers	BEA	U.C. per FTE	2.00	FTE	*720* 1,440	*$67.92* A20GB	*48902.4* $97,805	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $97,805
	Doc Editors, Procedures, TSR	BEA	U.C. per FTE	2.00	FTE	*720* 1,440	*$111.20* P19GB	*80064* $160,128	*0* $0	*0* $0	*0* $0	*0* $0	*80064* $160,128
	Consultants, Services Subcontracts, Advisory Panel	BEA	U.C. per Allow	2.00	Allow	0		*0* $0	*0* $0	*0* $0	*80000* $160,000	*0* $0	*80000* $160,000
	System Engineers	BEA	U.C. per FTE	3.50	FTE	*720* 2,520	*$151.24* E54W4	*108892.8* $381,125	*0* $0	*0* $0	*0* $0	*0* $0	*108892.8* $381,125
	Subtotal							$2,125,222	$0	$68,000	$160,000	$0	$2,353,222
	Sales Tax							$0	$0	$4,080	$0	$0	$4,080
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$2,357,302**
	Escalation							$277,341	$0	$9,406	$20,880	$0	$307,628
	Management Reserve							$0	$0	$0	$0	$0	$0
—Total 01 Contractor Readiness Preparation and Execution						**15,991**		**$2,402,563**	**$0**	**$81,486**	**$180,880**	**$0**	**$2,664,930**

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 DOE Readiness Review Support													
	TREAT Maint Supervisor	BEA	*U.C. per FTE*	0.01	FTE	*720* 7	*$193.54* Z03GB	*139349* $1,393	*0* $0	*0* $0	*0* $0	*0* $0	*139349* $1,393
	Heavy Equipment - cranes	BEA	*U.C. per FTE*	0.20	FTE	*720* 144	*$87.44* U71GB	*62956.8* $12,591	*0* $0	*0* $0	*0* $0	*0* $0	*62956.8* $12,591
	Maint Coordinator	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$173.22* Z02GB	*124718.4* $62,359	*0* $0	*0* $0	*0* $0	*0* $0	*124718.4* $62,359
	admin Support	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$67.92* A20GB	*48902.4* $24,451	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $24,451
	Electronics Tech	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$107.33* T04J1	*77277.6* $38,639	*0* $0	*0* $0	*0* $0	*0* $0	*77277.6* $38,639
	Electrician	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$87.60* U11GB	*63072* $31,536	*0* $0	*0* $0	*0* $0	*0* $0	*63072* $31,536
	Mechanic, Welder	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$87.78* U29GB	*63201.6* $31,601	*0* $0	*0* $0	*0* $0	*0* $0	*63201.6* $31,601
	Document Writer	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$67.92* A20GB	*48902.4* $48,902	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $48,902
	Services Subcontracts	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*0* $0	*40000* $40,000	*0* $0	*40000* $40,000
	Maintenance materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Maintenance system Parts, Equipment	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*60000* $60,000	*0* $0	*0* $0	*60000* $60,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 DOE Readiness Review Support													
		BEA	*U.C. per FTE*			*720*	*$132.89*	*95680.8*	*0*	*0*	*0*	*0*	*95680.8*
	Wrk Pkg Planners			2.00	FTE	1,440	F01GB	$191,362	$0	$0	$0	$0	$191,362
	Subtotal							$442,835	$0	$90,000	$40,000	$0	$572,835
	Sales Tax							$0	$0	$5,400	$0	$0	$5,400
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$578,235**
	Escalation							$57,790	$0	$12,450	$5,220	$0	$75,460
	Management Reserve							$0	$0	$0	$0	$0	$0
---Total	**02 DOE Readiness Review Support**					**4,111**		**$500,625**	**$0**	**$107,850**	**$45,220**	**$0**	**$653,694**
CR.10.16.05 Apply BEA Material G&A													
		BEA	*U.C. per mat$*		NT20			*0*	*0*	*0.15*	*0*	*0*	*0.15*
	Material G&A			1,649,995.00	mat$	0		$0	$0	$247,499	$0	$0	$247,499
	Subtotal							$0	$0	$247,499	$0	$0	$247,499
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$247,499**
	Escalation							$0	$0	$32,299	$0	$0	$32,299
	Management Reserve							$0	$0	$0	$0	$0	$0
---Total	**CR.10.16.05 Apply BEA Material G&A**					**0**		**$0**	**$0**	**$279,798**	**$0**	**$0**	**$279,798**
01 TREAT Operations													
		BEA	*U.C. per FTE*			*180*	*$193.54*	*34837.2*	*0*	*0*	*0*	*0*	*34837.2*
	TREAT Mgr			1.00	FTE	180	Z03GB	$34,837	$0	$0	$0	$0	$34,837
		BEA	*U.C. per FTE*			*180*	*$193.54*	*34837.2*	*0*	*0*	*0*	*0*	*34837.2*
	Supervisor			1.00	FTE	180	Z03GB	$34,837	$0	$0	$0	$0	$34,837

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
	Sr Reactor Operators	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$193.54* Z03GB	*34837.2* $69,674	*0* $0	*0* $0	*0* $0	*0* $0	*34837.2* $69,674
	SORC Chair	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$193.54* Z03GB	*34837.2* $34,837	*0* $0	*0* $0	*0* $0	*0* $0	*34837.2* $34,837
	NFM	BEA	*U.C. per FTE*	0.80	FTE	*180* 144	*$132.89* F01GB	*23920.2* $19,136	*0* $0	*0* $0	*0* $0	*0* $0	*23920.2* $19,136
	Nuc Safety Analyst (Old SAR)	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$141.77* E63W4	*25518.6* $25,519	*0* $0	*0* $0	*0* $0	*0* $0	*25518.6* $25,519
	ESS, USQ, SORC Member	BEA	*U.C. per FTE*	0.80	FTE	*180* 144	*$151.24* E54W4	*27223.2* $21,779	*0* $0	*0* $0	*0* $0	*0* $0	*27223.2* $21,779
	TREAT Operators	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$104.17* T05GB	*18750.6* $37,501	*0* $0	*0* $0	*0* $0	*0* $0	*18750.6* $37,501
	System Engineers	BEA	*U.C. per FTE*	3.50	FTE	*180* 630	*$151.24* E54W4	*27223.2* $95,281	*0* $0	*0* $0	*0* $0	*0* $0	*27223.2* $95,281
	Facility Support Services Coordinator	BEA	*U.C. per FTE*	0.10	FTE	*180* 18	*$173.22* Z02GB	*31179.6* $3,118	*0* $0	*0* $0	*0* $0	*0* $0	*31179.6* $3,118
	ES&H Support	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$151.78* E19H1	*27320.4* $13,660	*0* $0	*0* $0	*0* $0	*0* $0	*27320.4* $13,660
	Radcon Support	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$108.76* T13H6	*19576.8* $19,577	*0* $0	*0* $0	*0* $0	*0* $0	*19576.8* $19,577
	Admin Support	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$67.92* A20GB	*12225.6* $12,226	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $12,226
	Document Writers	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$67.92* A20GB	*12225.6* $24,451	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $24,451
	Doc Editors, Procedures, TSR	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$111.20* P19GB	*20016* $40,032	*0* $0	*0* $0	*0* $0	*0* $0	*20016* $40,032

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
	Drafting	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$87.36* T03W1	*15724.8* $15,725	*0* $0	*0* $0	*0* $0	*0* $0	*15724.8* $15,725
	PFC	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$99.49* P44F2	*17908.2* $8,954	*0* $0	*0* $0	*0* $0	*0* $0	*17908.2* $8,954
	Trainer	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$111.30* P23GB	*20034* $20,034	*0* $0	*0* $0	*0* $0	*0* $0	*20034* $20,034
	Security	BEA	*U.C. per FTE*	0.01	FTE	*180* 2	*$70.61* U59M4	*12710* $127	*0* $0	*0* $0	*0* $0	*0* $0	*12710* $127
	Consultants, Services Subcontracts, Advisory Panel	BEA	*U.C. per Allow*	2.00	Allow	0		*0* $0	*0* $0	*0* $0	*20000* $40,000	*0* $0	*20000* $40,000
	Travel - Nominal amount	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*2000* $2,000	*0* $0	*0* $0	*2000* $2,000
	Business materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*7500* $7,500	*0* $0	*0* $0	*7500* $7,500
	Maintenance Parts Supplies	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*7500* $7,500	*0* $0	*0* $0	*7500* $7,500
	Subtotal							$531,305	$0	$17,000	$40,000	$0	$588,305
	Sales Tax							$0	$0	$1,020	$0	$0	$1,020
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$589,325**
	Escalation							$69,335	$0	$2,352	$5,220	$0	$76,907
	Management Reserve							$0	$0	$0	$0	$0	$0
—Total 01 TREAT Operations						**3,998**		**$600,641**	**$0**	**$20,372**	**$45,220**	**$0**	**$666,232**

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
	TREAT Maint Supervisor	BEA	*U.C. per FTE*	0.01	FTE	*180* 2	*$193.54* Z03GB	*34837* $348	*0* $0	*0* $0	*0* $0	*0* $0	*34837* $348
	Wrk Pkg Planners	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$132.89* F01GB	*23920.2* $47,840	*0* $0	*0* $0	*0* $0	*0* $0	*23920.2* $47,840
	Maint Coordinator	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$173.22* Z02GB	*31179.6* $15,590	*0* $0	*0* $0	*0* $0	*0* $0	*31179.6* $15,590
	admin Support	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$67.92* A20GB	*12225.6* $6,113	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $6,113
	Document Writer	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$67.92* A20GB	*12225.6* $12,226	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $12,226
	Electronics Tech	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$107.33* T04J1	*19319.4* $9,660	*0* $0	*0* $0	*0* $0	*0* $0	*19319.4* $9,660
	Electrician	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$87.60* U11GB	*15768* $7,884	*0* $0	*0* $0	*0* $0	*0* $0	*15768* $7,884
	Mechanic, Welder	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$87.78* U29GB	*15800.4* $7,900	*0* $0	*0* $0	*0* $0	*0* $0	*15800.4* $7,900
	Heavy Equipment - cranes	BEA	*U.C. per FTE*	0.20	FTE	*180* 36	*$87.44* U71GB	*15739.2* $3,148	*0* $0	*0* $0	*0* $0	*0* $0	*15739.2* $3,148
	Services Subcontracts	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*0* $0	*10000* $10,000	*0* $0	*10000* $10,000
	Maintenance materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*7500* $7,500	*0* $0	*0* $0	*7500* $7,500

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
		BEA	*U.C. per Allow*					*0*	*0*	*15000*	*0*	*0*	*15000*
	Maintenance system Parts, Equipment			1.00	Allow	0		$0	$0	$15,000	$0	$0	$15,000
	Subtotal							$110,709	$0	$22,500	$10,000	$0	$143,209
	Sales Tax							$0	$0	$1,350	$0	$0	$1,350
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$144,559**
	Escalation							$14,447	$0	$3,112	$1,305	$0	$18,865
	Management Reserve							$0	$0	$0	$0	$0	$0
—Total 02 TREAT Maintenance (CM, PM, Deffered)						**1,028**		**$125,156**	**$0**	**$26,962**	**$11,305**	**$0**	**$163,424**
01 TREAT Operations													
		BEA	*U.C. per FTE*			*180*	*$193.54*	*34837.2*	*0*	*0*	*0*	*0*	*34837.2*
	TREAT Mgr			1.00	FTE	180	Z03GB	$34,837	$0	$0	$0	$0	$34,837
		BEA	*U.C. per FTE*			*180*	*$193.54*	*34837.2*	*0*	*0*	*0*	*0*	*34837.2*
	Supervisor			1.00	FTE	180	Z03GB	$34,837	$0	$0	$0	$0	$34,837
		BEA	*U.C. per FTE*			*180*	*$193.54*	*34837.2*	*0*	*0*	*0*	*0*	*34837.2*
	Sr Reactor Operators			2.00	FTE	360	Z03GB	$69,674	$0	$0	$0	$0	$69,674
		BEA	*U.C. per FTE*			*180*	*$193.54*	*34837.2*	*0*	*0*	*0*	*0*	*34837.2*
	SORC Chair			1.00	FTE	180	Z03GB	$34,837	$0	$0	$0	$0	$34,837
		BEA	*U.C. per FTE*			*180*	*$132.89*	*23920.2*	*0*	*0*	*0*	*0*	*23920.2*
	NFM			0.80	FTE	144	F01GB	$19,136	$0	$0	$0	$0	$19,136
		BEA	*U.C. per FTE*			*180*	*$141.77*	*25518.6*	*0*	*0*	*0*	*0*	*25518.6*
	Nuc Safety Analyst (Old SAR)			1.00	FTE	180	E63W4	$25,519	$0	$0	$0	$0	$25,519
		BEA	*U.C. per FTE*			*180*	*$151.24*	*27223.2*	*0*	*0*	*0*	*0*	*27223.2*
	ESS, USQ, SORC Member			0.80	FTE	144	E54W4	$21,779	$0	$0	$0	$0	$21,779

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
	TREAT Operators	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$104.17* T05GB	*18750.6* $37,501	*0* $0	*0* $0	*0* $0	*0* $0	*18750.6* $37,501
	System Engineers	BEA	*U.C. per FTE*	3.50	FTE	*180* 630	*$151.24* E54W4	*27223.2* $95,281	*0* $0	*0* $0	*0* $0	*0* $0	*27223.2* $95,281
	Facility Support Services Coordinator	BEA	*U.C. per FTE*	0.10	FTE	*180* 18	*$173.22* Z02GB	*31179.6* $3,118	*0* $0	*0* $0	*0* $0	*0* $0	*31179.6* $3,118
	ES&H Support	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$151.78* E19H1	*27320.4* $13,660	*0* $0	*0* $0	*0* $0	*0* $0	*27320.4* $13,660
	Radcon Support	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$108.76* T13H6	*19576.8* $19,577	*0* $0	*0* $0	*0* $0	*0* $0	*19576.8* $19,577
	Admin Support	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$67.92* A20GB	*12225.6* $12,226	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $12,226
	Document Writers	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$67.92* A20GB	*12225.6* $24,451	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $24,451
	Doc Editors, Procedures, TSR	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$111.20* P19GB	*20016* $40,032	*0* $0	*0* $0	*0* $0	*0* $0	*20016* $40,032
	Drafting	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$87.36* T03W1	*15724.8* $15,725	*0* $0	*0* $0	*0* $0	*0* $0	*15724.8* $15,725
	PFC	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$99.49* P44F2	*17908.2* $8,954	*0* $0	*0* $0	*0* $0	*0* $0	*17908.2* $8,954
	Trainer	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$111.30* P23GB	*20034* $20,034	*0* $0	*0* $0	*0* $0	*0* $0	*20034* $20,034
	Security	BEA	*U.C. per FTE*	0.01	FTE	*180* 2	*$70.61* U59M4	*12710* $127	*0* $0	*0* $0	*0* $0	*0* $0	*12710* $127
	Consultants, Services Subcontracts, Advisory Panel	BEA	*U.C. per Allow*	2.00	Allow	0		*0* $0	*0* $0	*0* $0	*20000* $40,000	*0* $0	*20000* $40,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
	Travel - Nominal amount	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*2000* $2,000	*0* $0	*0* $0	*2000* $2,000
	Business materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*7500* $7,500	*0* $0	*0* $0	*7500* $7,500
	Maintenance Parts Supplies	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*7500* $7,500	*0* $0	*0* $0	*7500* $7,500
	Subtotal							$531,305	$0	$17,000	$40,000	$0	$588,305
	Sales Tax							$0	$0	$1,020	$0	$0	$1,020
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$589,325**
	Escalation							$69,335	$0	$2,352	$5,220	$0	$76,907
	Management Reserve							$0	$0	$0	$0	$0	$0
Total 01 TREAT Operations						**3,998**		**$600,641**	**$0**	**$20,372**	**$45,220**	**$0**	**$666,232**
02 TREAT Maintenance (CM, PM, Deffered)													
	TREAT Maint Supervisor	BEA	*U.C. per FTE*	0.01	FTE	*180* 2	*$193.54* Z03GB	*34837* $348	*0* $0	*0* $0	*0* $0	*0* $0	*34837* $348
	Wrk Pkg Planners	BEA	*U.C. per FTE*	2.00	FTE	*180* 360	*$132.89* F01GB	*23920.2* $47,840	*0* $0	*0* $0	*0* $0	*0* $0	*23920.2* $47,840
	Maint Coordinator	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$173.22* Z02GB	*31179.6* $15,590	*0* $0	*0* $0	*0* $0	*0* $0	*31179.6* $15,590
	admin Support	BEA	*U.C. per FTE*	0.50	FTE	*180* 90	*$67.92* A20GB	*12225.6* $6,113	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $6,113
	Document Writer	BEA	*U.C. per FTE*	1.00	FTE	*180* 180	*$67.92* A20GB	*12225.6* $12,226	*0* $0	*0* $0	*0* $0	*0* $0	*12225.6* $12,226

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
		BEA	*U.C. per FTE*			*180*	*$107.33*	*19319.4*	*0*	*0*	*0*	*0*	*19319.4*
	Electronics Tech			0.50	FTE	90	T04J1	$9,660	$0	$0	$0	$0	$9,660
		BEA	*U.C. per FTE*			*180*	*$87.60*	*15768*	*0*	*0*	*0*	*0*	*15768*
	Electrician			0.50	FTE	90	U11GB	$7,884	$0	$0	$0	$0	$7,884
		BEA	*U.C. per FTE*			*180*	*$87.78*	*15800.4*	*0*	*0*	*0*	*0*	*15800.4*
	Mechanic, Welder			0.50	FTE	90	U29GB	$7,900	$0	$0	$0	$0	$7,900
		BEA	*U.C. per FTE*			*180*	*$87.44*	*15739.2*	*0*	*0*	*0*	*0*	*15739.2*
	Heavy Equipment - cranes			0.20	FTE	36	U71GB	$3,148	$0	$0	$0	$0	$3,148
		BEA	*U.C. per Allow*					*0*	*0*	*0*	*10000*	*0*	*10000*
	Services Subcontracts			1.00	Allow	0		$0	$0	$0	$10,000	$0	$10,000
		BEA	*U.C. per Allow*					*0*	*0*	*7500*	*0*	*0*	*7500*
	Maintenance materials			1.00	Allow	0		$0	$0	$7,500	$0	$0	$7,500
		BEA	*U.C. per Allow*					*0*	*0*	*15000*	*0*	*0*	*15000*
	Maintenance system Parts, Equipment			1.00	Allow	0		$0	$0	$15,000	$0	$0	$15,000
	Subtotal							$110,709	$0	$22,500	$10,000	$0	$143,209
	Sales Tax							$0	$0	$1,350	$0	$0	$1,350
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$144,559**
	Escalation							$14,447	$0	$3,112	$1,305	$0	$18,865
	Management Reserve							$0	$0	$0	$0	$0	$0
—Total 02 TREAT Maintenance (CM, PM, Deffered)						**1,028**		**$125,156**	**$0**	**$26,962**	**$11,305**	**$0**	**$163,424**
01 TREAT Operations													
		BEA	*U.C. per FTE*			*450*	*$70.61*	*31775*	*0*	*0*	*0*	*0*	*31775*
	Security			0.01	FTE	5	U59M4	$318	$0	$0	$0	$0	$318

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations												
	Facility Support Services Coordinator	BEA U.C. per FTE	0.10	FTE	*450* 45	*$173.22* Z02GB	*77949* $7,795	*0* $0	*0* $0	*0* $0	*0* $0	*77949* $7,795
	ES&H Support	BEA U.C. per FTE	0.50	FTE	*450* 225	*$151.78* E19H1	*68301* $34,151	*0* $0	*0* $0	*0* $0	*0* $0	*68301* $34,151
	PFC	BEA U.C. per FTE	0.50	FTE	*450* 225	*$99.49* P44F2	*44770.5* $22,385	*0* $0	*0* $0	*0* $0	*0* $0	*44770.5* $22,385
	NFM	BEA U.C. per FTE	0.80	FTE	*450* 360	*$132.89* F01GB	*59800.5* $47,840	*0* $0	*0* $0	*0* $0	*0* $0	*59800.5* $47,840
	ESS, USQ, SORC Member	BEA U.C. per FTE	0.80	FTE	*450* 360	*$151.24* E54W4	*68058* $54,446	*0* $0	*0* $0	*0* $0	*0* $0	*68058* $54,446
	TREAT Mgr	BEA U.C. per FTE	1.00	FTE	*450* 450	*$193.54* Z03GB	*87093* $87,093	*0* $0	*0* $0	*0* $0	*0* $0	*87093* $87,093
	Supervisor	BEA U.C. per FTE	1.00	FTE	*450* 450	*$193.54* Z03GB	*87093* $87,093	*0* $0	*0* $0	*0* $0	*0* $0	*87093* $87,093
	SORC Chair	BEA U.C. per FTE	1.00	FTE	*450* 450	*$193.54* Z03GB	*87093* $87,093	*0* $0	*0* $0	*0* $0	*0* $0	*87093* $87,093
	Nuc Safety Analyst (Old SAR)	BEA U.C. per FTE	1.00	FTE	*450* 450	*$141.77* E63W4	*63796.5* $63,797	*0* $0	*0* $0	*0* $0	*0* $0	*63796.5* $63,797
	Radcon Support	BEA U.C. per FTE	1.00	FTE	*450* 450	*$108.76* T13H6	*48942* $48,942	*0* $0	*0* $0	*0* $0	*0* $0	*48942* $48,942
	Admin Support	BEA U.C. per FTE	1.00	FTE	*450* 450	*$67.92* A20GB	*30564* $30,564	*0* $0	*0* $0	*0* $0	*0* $0	*30564* $30,564
	Drafting	BEA U.C. per FTE	1.00	FTE	*450* 450	*$87.36* T03W1	*39312* $39,312	*0* $0	*0* $0	*0* $0	*0* $0	*39312* $39,312
	Trainer	BEA U.C. per FTE	1.00	FTE	*450* 450	*$111.30* P23GB	*50085* $50,085	*0* $0	*0* $0	*0* $0	*0* $0	*50085* $50,085

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
	Travel - Nominal amount	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*5000* $5,000	*0* $0	*0* $0	*5000* $5,000
	Business materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*18750* $18,750	*0* $0	*0* $0	*18750* $18,750
	Maintenance Parts Supplies	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*18750* $18,750	*0* $0	*0* $0	*18750* $18,750
	Sr Reactor Operators	BEA	*U.C. per FTE*	2.00	FTE	*450* 900	*$193.54* Z03GB	*87093* $174,186	*0* $0	*0* $0	*0* $0	*0* $0	*87093* $174,186
	TREAT Operators	BEA	*U.C. per FTE*	2.00	FTE	*450* 900	*$104.17* T05GB	*46876.5* $93,753	*0* $0	*0* $0	*0* $0	*0* $0	*46876.5* $93,753
	Document Writers	BEA	*U.C. per FTE*	2.00	FTE	*450* 900	*$67.92* A20GB	*30564* $61,128	*0* $0	*0* $0	*0* $0	*0* $0	*30564* $61,128
	Doc Editors, Procedures, TSR	BEA	*U.C. per FTE*	2.00	FTE	*450* 900	*$111.20* P19GB	*50040* $100,080	*0* $0	*0* $0	*0* $0	*0* $0	*50040* $100,080
	Consultants, Services Subcontracts, Advisory Panel	BEA	*U.C. per Allow*	2.00	Allow	0		*0* $0	*0* $0	*0* $0	*50000* $100,000	*0* $0	*50000* $100,000
	System Engineers	BEA	*U.C. per FTE*	3.50	FTE	*450* 1,575	*$151.24* E54W4	*68058* $238,203	*0* $0	*0* $0	*0* $0	*0* $0	*68058* $238,203
	Subtotal							$1,328,264	$0	$42,500	$100,000	$0	$1,470,764
	Sales Tax							$0	$0	$2,550	$0	$0	$2,550
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$1,473,314**
	Escalation							$173,338	$0	$5,879	$13,050	$0	$192,267
	Management Reserve							$0	$0	$0	$0	$0	$0
	---Total 01 TREAT Operations					**9,995**		**$1,501,602**	**$0**	**$50,929**	**$113,050**	**$0**	**$1,665,581**

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
	TREAT Maint Supervisor	BEA	*U.C. per FTE*	0.01	FTE	*450* 5	*$193.54* Z03GB	*87093* $871	*0* $0	*0* $0	*0* $0	*0* $0	*87093* $871
	Heavy Equipment - cranes	BEA	*U.C. per FTE*	0.20	FTE	*450* 90	*$87.44* U71GB	*39348* $7,870	*0* $0	*0* $0	*0* $0	*0* $0	*39348* $7,870
	Maint Coordinator	BEA	*U.C. per FTE*	0.50	FTE	*450* 225	*$173.22* Z02GB	*77949* $38,975	*0* $0	*0* $0	*0* $0	*0* $0	*77949* $38,975
	admin Support	BEA	*U.C. per FTE*	0.50	FTE	*450* 225	*$67.92* A20GB	*30564* $15,282	*0* $0	*0* $0	*0* $0	*0* $0	*30564* $15,282
	Electronics Tech	BEA	*U.C. per FTE*	0.50	FTE	*450* 225	*$107.33* T04J1	*48298.5* $24,149	*0* $0	*0* $0	*0* $0	*0* $0	*48298.5* $24,149
	Electrician	BEA	*U.C. per FTE*	0.50	FTE	*450* 225	*$87.60* U11GB	*39420* $19,710	*0* $0	*0* $0	*0* $0	*0* $0	*39420* $19,710
	Mechanic, Welder	BEA	*U.C. per FTE*	0.50	FTE	*450* 225	*$87.78* U29GB	*39501* $19,751	*0* $0	*0* $0	*0* $0	*0* $0	*39501* $19,751
	Document Writer	BEA	*U.C. per FTE*	1.00	FTE	*450* 450	*$67.92* A20GB	*30564* $30,564	*0* $0	*0* $0	*0* $0	*0* $0	*30564* $30,564
	Services Subcontracts	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*0* $0	*25000* $25,000	*0* $0	*25000* $25,000
	Maintenance materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*18750* $18,750	*0* $0	*0* $0	*18750* $18,750
	Maintenance system Parts, Equipment	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*37500* $37,500	*0* $0	*0* $0	*37500* $37,500

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
		BEA	*U.C. per FTE*			*450*	*$132.89*	*59800.5*	*0*	*0*	*0*	*0*	*59800.5*
	Wrk Pkg Planners			2.00	FTE	900	F01GB	$119,601	$0	$0	$0	$0	$119,601
	Subtotal							$276,772	$0	$56,250	$25,000	$0	$358,022
	Sales Tax							$0	$0	$3,375	$0	$0	$3,375
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$361,397**
	Escalation							$36,119	$0	$7,781	$3,263	$0	$47,162
	Management Reserve							$0	$0	$0	$0	$0	$0
---Total 02 TREAT Maintenance (CM, PM, Deffered)						**2,570**		**$312,890**	**$0**	**$67,406**	**$28,263**	**$0**	**$408,559**
01 TREAT Operations													
		BEA	*U.C. per FTE*			*720*	*$70.61*	*50839*	*0*	*0*	*0*	*0*	*50839*
	Security			0.01	FTE	7	U59M4	$508	$0	$0	$0	$0	$508
		BEA	*U.C. per FTE*			*720*	*$173.22*	*124718.4*	*0*	*0*	*0*	*0*	*124718.4*
	Facility Support Services Coordinator			0.10	FTE	72	Z02GB	$12,472	$0	$0	$0	$0	$12,472
		BEA	*U.C. per FTE*			*720*	*$151.78*	*109281.6*	*0*	*0*	*0*	*0*	*109281.6*
	ES&H Support			0.50	FTE	360	E19H1	$54,641	$0	$0	$0	$0	$54,641
		BEA	*U.C. per FTE*			*720*	*$99.49*	*71632.8*	*0*	*0*	*0*	*0*	*71632.8*
	PFC			0.50	FTE	360	P44F2	$35,816	$0	$0	$0	$0	$35,816
		BEA	*U.C. per FTE*			*720*	*$132.89*	*95680.8*	*0*	*0*	*0*	*0*	*95680.8*
	NFM			0.80	FTE	576	F01GB	$76,545	$0	$0	$0	$0	$76,545
		BEA	*U.C. per FTE*			*720*	*$151.24*	*108892.8*	*0*	*0*	*0*	*0*	*108892.8*
	ESS, USQ, SORC Member			0.80	FTE	576	E54W4	$87,114	$0	$0	$0	$0	$87,114
		BEA	*U.C. per FTE*			*720*	*$193.54*	*139348.8*	*0*	*0*	*0*	*0*	*139348.8*
	TREAT Mgr			1.00	FTE	720	Z03GB	$139,349	$0	$0	$0	$0	$139,349

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
	Supervisor	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$193.54* Z03GB	*139348.8* $139,349	*0* $0	*0* $0	*0* $0	*0* $0	*139348.8* $139,349
	SORC Chair	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$193.54* Z03GB	*139348.8* $139,349	*0* $0	*0* $0	*0* $0	*0* $0	*139348.8* $139,349
	Nuc Safety Analyst (Old SAR)	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$141.77* E63W4	*102074.4* $102,074	*0* $0	*0* $0	*0* $0	*0* $0	*102074.4* $102,074
	Radcon Support	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$108.76* T13H6	*78307.2* $78,307	*0* $0	*0* $0	*0* $0	*0* $0	*78307.2* $78,307
	Admin Support	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$67.92* A20GB	*48902.4* $48,902	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $48,902
	Drafting	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$87.36* T03W1	*62899.2* $62,899	*0* $0	*0* $0	*0* $0	*0* $0	*62899.2* $62,899
	Trainer	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$111.30* P23GB	*80136* $80,136	*0* $0	*0* $0	*0* $0	*0* $0	*80136* $80,136
	Travel - Nominal amount	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*8000* $8,000	*0* $0	*0* $0	*8000* $8,000
	Business materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Maintenance Parts Supplies	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Sr Reactor Operators	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$193.54* Z03GB	*139348.8* $278,698	*0* $0	*0* $0	*0* $0	*0* $0	*139348.8* $278,698
	TREAT Operators	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$104.17* T05GB	*75002.4* $150,005	*0* $0	*0* $0	*0* $0	*0* $0	*75002.4* $150,005
	Document Writers	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$67.92* A20GB	*48902.4* $97,805	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $97,805

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
		BEA	*U.C. per FTE*			*720*	*$111.20*	*80064*	*0*	*0*	*0*	*0*	*80064*
	Doc Editors, Procedures, TSR			2.00	FTE	1,440	P19GB	$160,128	$0	$0	$0	$0	$160,128
		BEA	*U.C. per Allow*					*0*	*0*	*0*	*80000*	*0*	*80000*
	Consultants, Services Subcontracts, Advisory Panel			2.00	Allow	0		$0	$0	$0	$160,000	$0	$160,000
		BEA	*U.C. per FTE*			*720*	*$151.24*	*108892.8*	*0*	*0*	*0*	*0*	*108892.8*
	System Engineers			3.50	FTE	2,520	E54W4	$381,125	$0	$0	$0	$0	$381,125
	Subtotal							$2,125,222	$0	$68,000	$160,000	$0	$2,353,222
	Sales Tax							$0	$0	$4,080	$0	$0	$4,080
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$2,357,302**
	Escalation							$277,341	$0	$9,406	$20,880	$0	$307,628
	Management Reserve							$0	$0	$0	$0	$0	$0
	---Total 01 TREAT Operations					**15,991**		**$2,402,563**	**$0**	**$81,486**	**$180,880**	**$0**	**$2,664,930**
02 TREAT Maintenance (CM, PM, Deffered)													
		BEA	*U.C. per FTE*			*720*	*$193.54*	*139349*	*0*	*0*	*0*	*0*	*139349*
	TREAT Maint Supervisor			0.01	FTE	7	Z03GB	$1,393	$0	$0	$0	$0	$1,393
		BEA	*U.C. per FTE*			*720*	*$87.44*	*62956.8*	*0*	*0*	*0*	*0*	*62956.8*
	Heavy Equipment - cranes			0.20	FTE	144	U71GB	$12,591	$0	$0	$0	$0	$12,591
		BEA	*U.C. per FTE*			*720*	*$173.22*	*124718.4*	*0*	*0*	*0*	*0*	*124718.4*
	Maint Coordinator			0.50	FTE	360	Z02GB	$62,359	$0	$0	$0	$0	$62,359
		BEA	*U.C. per FTE*			*720*	*$67.92*	*48902.4*	*0*	*0*	*0*	*0*	*48902.4*
	admin Support			0.50	FTE	360	A20GB	$24,451	$0	$0	$0	$0	$24,451
		BEA	*U.C. per FTE*			*720*	*$107.33*	*77277.6*	*0*	*0*	*0*	*0*	*77277.6*
	Electronics Tech			0.50	FTE	360	T04J1	$38,639	$0	$0	$0	$0	$38,639

C-100

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
	Electrician	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$87.60* U11GB	*63072* $31,536	*0* $0	*0* $0	*0* $0	*0* $0	*63072* $31,536
	Mechanic, Welder	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$87.78* U29GB	*63201.6* $31,601	*0* $0	*0* $0	*0* $0	*0* $0	*63201.6* $31,601
	Document Writer	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$67.92* A20GB	*48902.4* $48,902	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $48,902
	Services Subcontracts	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*0* $0	*40000* $40,000	*0* $0	*40000* $40,000
	Maintenance materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Maintenance system Parts, Equipment	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*60000* $60,000	*0* $0	*0* $0	*60000* $60,000
	Wrk Pkg Planners	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$132.89* F01GB	*95680.8* $191,362	*0* $0	*0* $0	*0* $0	*0* $0	*95680.8* $191,362
	Subtotal							$442,835	$0	$90,000	$40,000	$0	$572,835
	Sales Tax							$0	$0	$5,400	$0	$0	$5,400
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$578,235**
	Escalation							$57,790	$0	$12,450	$5,220	$0	$75,460
	Management Reserve							$0	$0	$0	$0	$0	$0
—Total 02 TREAT Maintenance (CM, PM, Deffered)						**4,111**		**$500,625**	**$0**	**$107,850**	**$45,220**	**$0**	**$653,694**
01 TREAT Operations													
	Security	BEA	*U.C. per FTE*	0.01	FTE	*720* 7	*$70.61* U59M4	*50839* $508	*0* $0	*0* $0	*0* $0	*0* $0	*50839* $508

C-101

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations												
		BEA	*U.C. per FTE*		*720*	*$173.22*	*124718.4*	*0*	*0*	*0*	*0*	*124718.4*
	Facility Support Services Coordinator		0.10	FTE	72	Z02GB	$12,472	$0	$0	$0	$0	$12,472
		BEA	*U.C. per FTE*		*720*	*$151.78*	*109281.6*	*0*	*0*	*0*	*0*	*109281.6*
	ES&H Support		0.50	FTE	360	E19H1	$54,641	$0	$0	$0	$0	$54,641
		BEA	*U.C. per FTE*		*720*	*$99.49*	*71632.8*	*0*	*0*	*0*	*0*	*71632.8*
	PFC		0.50	FTE	360	P44F2	$35,816	$0	$0	$0	$0	$35,816
		BEA	*U.C. per FTE*		*720*	*$132.89*	*95680.8*	*0*	*0*	*0*	*0*	*95680.8*
	NFM		0.80	FTE	576	F01GB	$76,545	$0	$0	$0	$0	$76,545
		BEA	*U.C. per FTE*		*720*	*$151.24*	*108892.8*	*0*	*0*	*0*	*0*	*108892.8*
	ESS, USQ, SORC Member		0.80	FTE	576	E54W4	$87,114	$0	$0	$0	$0	$87,114
		BEA	*U.C. per FTE*		*720*	*$193.54*	*139348.8*	*0*	*0*	*0*	*0*	*139348.8*
	TREAT Mgr		1.00	FTE	720	Z03GB	$139,349	$0	$0	$0	$0	$139,349
		BEA	*U.C. per FTE*		*720*	*$193.54*	*139348.8*	*0*	*0*	*0*	*0*	*139348.8*
	Supervisor		1.00	FTE	720	Z03GB	$139,349	$0	$0	$0	$0	$139,349
		BEA	*U.C. per FTE*		*720*	*$193.54*	*139348.8*	*0*	*0*	*0*	*0*	*139348.8*
	SORC Chair		1.00	FTE	720	Z03GB	$139,349	$0	$0	$0	$0	$139,349
		BEA	*U.C. per FTE*		*720*	*$141.77*	*102074.4*	*0*	*0*	*0*	*0*	*102074.4*
	Nuc Safety Analyst (Old SAR)		1.00	FTE	720	E63W4	$102,074	$0	$0	$0	$0	$102,074
		BEA	*U.C. per FTE*		*720*	*$108.76*	*78307.2*	*0*	*0*	*0*	*0*	*78307.2*
	Radcon Support		1.00	FTE	720	T13H6	$78,307	$0	$0	$0	$0	$78,307
		BEA	*U.C. per FTE*		*720*	*$67.92*	*48902.4*	*0*	*0*	*0*	*0*	*48902.4*
	Admin Support		1.00	FTE	720	A20GB	$48,902	$0	$0	$0	$0	$48,902
		BEA	*U.C. per FTE*		*720*	*$87.36*	*62899.2*	*0*	*0*	*0*	*0*	*62899.2*
	Drafting		1.00	FTE	720	T03W1	$62,899	$0	$0	$0	$0	$62,899
		BEA	*U.C. per FTE*		*720*	*$111.30*	*80136*	*0*	*0*	*0*	*0*	*80136*
	Trainer		1.00	FTE	720	P23GB	$80,136	$0	$0	$0	$0	$80,136

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
01 TREAT Operations													
	Travel - Nominal amount	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*8000* $8,000	*0* $0	*0* $0	*8000* $8,000
	Business materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Maintenance Parts Supplies	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Sr Reactor Operators	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$193.54* Z03GB	*139348.8* $278,698	*0* $0	*0* $0	*0* $0	*0* $0	*139348.8* $278,698
	TREAT Operators	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$104.17* T05GB	*75002.4* $150,005	*0* $0	*0* $0	*0* $0	*0* $0	*75002.4* $150,005
	Document Writers	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$67.92* A20GB	*48902.4* $97,805	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $97,805
	Doc Editors, Procedures, TSR	BEA	*U.C. per FTE*	2.00	FTE	*720* 1,440	*$111.20* P19GB	*80064* $160,128	*0* $0	*0* $0	*0* $0	*0* $0	*80064* $160,128
	Consultants, Services Subcontracts, Advisory Panel	BEA	*U.C. per Allow*	2.00	Allow	0		*0* $0	*0* $0	*0* $0	*80000* $160,000	*0* $0	*80000* $160,000
	System Engineers	BEA	*U.C. per FTE*	3.50	FTE	*720* 2,520	*$151.24* E54W4	*108892.8* $381,125	*0* $0	*0* $0	*0* $0	*0* $0	*108892.8* $381,125
	Subtotal							$2,125,222	$0	$68,000	$160,000	$0	$2,353,222
	Sales Tax							$0	$0	$4,080	$0	$0	$4,080
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$2,357,302**
	Escalation							$277,341	$0	$9,406	$20,880	$0	$307,628
	Management Reserve							$0	$0	$0	$0	$0	$0
—Total 01 TREAT Operations						**15,991**		**$2,402,563**	**$0**	**$81,486**	**$180,880**	**$0**	**$2,664,930**

C-103

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)													
	TREAT Maint Supervisor	BEA	*U.C. per FTE*	0.01	FTE	*720* 7	*$193.54* Z03GB	*139349* $1,393	*0* $0	*0* $0	*0* $0	*0* $0	*139349* $1,393
	Heavy Equipment - cranes	BEA	*U.C. per FTE*	0.20	FTE	*720* 144	*$87.44* U71GB	*62956.8* $12,591	*0* $0	*0* $0	*0* $0	*0* $0	*62956.8* $12,591
	Maint Coordinator	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$173.22* Z02GB	*124718.4* $62,359	*0* $0	*0* $0	*0* $0	*0* $0	*124718.4* $62,359
	admin Support	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$67.92* A20GB	*48902.4* $24,451	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $24,451
	Electronics Tech	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$107.33* T04J1	*77277.6* $38,639	*0* $0	*0* $0	*0* $0	*0* $0	*77277.6* $38,639
	Electrician	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$87.60* U11GB	*63072* $31,536	*0* $0	*0* $0	*0* $0	*0* $0	*63072* $31,536
	Mechanic, Welder	BEA	*U.C. per FTE*	0.50	FTE	*720* 360	*$87.78* U29GB	*63201.6* $31,601	*0* $0	*0* $0	*0* $0	*0* $0	*63201.6* $31,601
	Document Writer	BEA	*U.C. per FTE*	1.00	FTE	*720* 720	*$67.92* A20GB	*48902.4* $48,902	*0* $0	*0* $0	*0* $0	*0* $0	*48902.4* $48,902
	Services Subcontracts	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*0* $0	*40000* $40,000	*0* $0	*40000* $40,000
	Maintenance materials	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*30000* $30,000	*0* $0	*0* $0	*30000* $30,000
	Maintenance system Parts, Equipment	BEA	*U.C. per Allow*	1.00	Allow	0		*0* $0	*0* $0	*60000* $60,000	*0* $0	*0* $0	*60000* $60,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
02 TREAT Maintenance (CM, PM, Deffered)												
	BEA	*U.C. per FTE*			*720*	*$132.89*	*95680.8*	*0*	*0*	*0*	*0*	*95680.8*
Wrk Pkg Planners			2.00	FTE	1,440	F01GB	$191,362	$0	$0	$0	$0	$191,362
Subtotal							$442,835	$0	$90,000	$40,000	$0	$572,835
Sales Tax							$0	$0	$5,400	$0	$0	$5,400
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$578,235**
Escalation							$57,790	$0	$12,450	$5,220	$0	$75,460
Management Reserve							$0	$0	$0	$0	$0	$0
---Total 02 TREAT Maintenance (CM, PM, Deffered)					**4,111**		**$500,625**	**$0**	**$107,850**	**$45,220**	**$0**	**$653,694**
CR.10.16.05 Apply BEA Material G&A												
	BEA	*U.C. per mat$*		NT20			*0*	*0*	*0.15*	*0*	*0*	*0.15*
Material G&A			4,534,534.00	mat$	0		$0	$0	$680,180	$0	$0	$680,180
Subtotal							$0	$0	$680,180	$0	$0	$680,180
Sales Tax							$0	$0	$0	$0	$0	$0
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$680,180**
Escalation							$0	$0	$88,764	$0	$0	$88,764
Management Reserve							$0	$0	$0	$0	$0	$0
---Total CR.10.16.05 Apply BEA Material G&A					**0**		**$0**	**$0**	**$768,944**	**$0**	**$0**	**$768,944**
CR.10.17.03 Apply Subcontracts G&A												
	BEA	*U.C. per Subc$*		NT21			*0*	*0*	*0.029*	*0*	*0*	*0.029*
Subcontract G&A			1,388,600.00	Subc$	0		$0	$0	$40,269	$0	$0	$40,269

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.17.03 Apply Subcontracts G&A												
	Subtotal						$0	$0	$40,269	$0	$0	$40,269
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$40,269**
	Escalation						$0	$0	$48,198	$0	$0	$48,198
	Management Reserve						$0	$0	$0	$0	$0	$0
---Total	**CR.10.17.03 Apply Subcontracts G&A**				**0**		**$0**	**$0**	**$88,468**	**$0**	**$0**	**$88,468**
CR.10.16.02.01 Project Management B - CAP												
	Memo:	***All TREAT refurbishment Costs are based on BEA estimate 1C40-C***										
		Labor hours for development of Project Execution Plans (PEP) are included in PM/PE hours.										
		BEA	*U.C. per YRS*		*356*	*$205.00*	*72980*	*0*	*0*	*0*	*0*	*72980*
	Project manager		0.40	YRS	142	PM/PE	$29,192	$0	$0	$0	$0	$29,192
		BEA	*U.C. per YRS*		*356*	*$205.00*	*72980*	*0*	*0*	*0*	*0*	*72980*
	Project engineer		0.40	YRS	142	PM/PE	$29,192	$0	$0	$0	$0	$29,192
		BEA	*U.C. per YRS*		*356*	*$65.00*	*23140*	*0*	*0*	*0*	*0*	*23140*
	INL Admin, Doc. control		0.40	YRS	142	ADM	$9,256	$0	$0	$0	$0	$9,256
	Subtotal						$67,640	$0	$0	$0	$0	$67,640
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$67,640**
	Escalation						$8,827	$0	$0	$0	$0	$8,827
	Management Reserve						$11,690	$0	$0	$0	$0	$11,690
---Total	**CR.10.16.02.01 Project Management B - CAP**				**427**		**$88,157**	**$0**	**$0**	**$0**	**$0**	**$88,157**

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.16.02.01 Project Management B - CAP													
Memo:	***All TREAT refurbishment Costs are based on BEA estimate 1C40-C***												
	Labor hours for development of Project Execution Plans (PEP) are included in PM/PE hours.												
		BEA	*U.C. per YRS*			*356.4*	*$205.00*	*73062*	*0*	*0*	*0*	*0*	*73062*
	Project manager			0.40	YRS	143	PM/PE	$29,225	$0	$0	$0	$0	$29,225
		BEA	*U.C. per YRS*			*356.4*	*$205.00*	*73062*	*0*	*0*	*0*	*0*	*73062*
	Project engineer			0.40	YRS	143	PM/PE	$29,225	$0	$0	$0	$0	$29,225
		BEA	*U.C. per YRS*			*356.4*	*$65.00*	*23166*	*0*	*0*	*0*	*0*	*23166*
	INL Admin, Doc. control			0.40	YRS	143	ADM	$9,266	$0	$0	$0	$0	$9,266
	Subtotal							$67,716	$0	$0	$0	$0	$67,716
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$67,716**
	Escalation							$8,837	$0	$0	$0	$0	$8,837
	Management Reserve							$5,643	$0	$0	$0	$0	$5,643
---Total	**CR.10.16.02.01 Project Management B - CAP**					**428**		**$82,196**	**$0**	**$0**	**$0**	**$0**	**$82,196**
CR.10.16.02.02 Project Controls A - OPC													
		BEA	*U.C. per LS*			*435.6*	*$105.00*	*45738*	*0*	*0*	*0*	*0*	*45738*
	Project controls engineer			0.92	LS	401	PCE	$42,079	$0	$0	$0	$0	$42,079
		BEA	*U.C. per LS*			*396.4*	*$120.00*	*47568*	*0*	*0*	*0*	*0*	*47568*
	Project scheduling			0.92	LS	365	PLANNER	$43,763	$0	$0	$0	$0	$43,763

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.16.02.02 Project Controls A - OPC													
	BEA	*U.C. per LS*				*435.6*	*$65.00*	*28314*	*0*	*0*	*0*	*0*	*28314*
	Administrative records management			0.92	LS	401	ADM	$26,049	$0	$0	$0	$0	$26,049
	Subtotal							$111,890	$0	$0	$0	$0	$111,890
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$111,890**
	Escalation							$14,602	$0	$0	$0	$0	$14,602
	Management Reserve							$9,655	$0	$0	$0	$0	$9,655
---Total CR.10.16.02.02 Project Controls A - OPC						**1,166**		**$136,147**	**$0**	**$0**	**$0**	**$0**	**$136,147**
CR.10.16.02.02 Project Controls B -CAP													
	BEA	*U.C. per LS*				*435.6*	*$105.00*	*45738*	*0*	*0*	*0*	*0*	*45738*
	Project controls engineer			0.08	LS	35	PCE	$3,659	$0	$0	$0	$0	$3,659
	BEA	*U.C. per LS*				*396.4*	*$120.00*	*47568*	*0*	*0*	*0*	*0*	*47568*
	Project scheduling			0.08	LS	32	PLANNER	$3,805	$0	$0	$0	$0	$3,805
	BEA	*U.C. per LS*				*435.6*	*$65.00*	*28314*	*0*	*0*	*0*	*0*	*28314*
	Administrative records management			0.08	LS	35	ADM	$2,265	$0	$0	$0	$0	$2,265
	Subtotal							$9,730	$0	$0	$0	$0	$9,730
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$9,730**
	Escalation							$1,270	$0	$0	$0	$0	$1,270
	Management Reserve							$840	$0	$0	$0	$0	$840
---Total CR.10.16.02.02 Project Controls B -CAP						**101**		**$11,839**	**$0**	**$0**	**$0**	**$0**	**$11,839**

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.16.02.03 Project Closeout													
	BEA	*U.C. per LS*				*1544.4*	*$119.38*	*184370.47*	*0*	*0*	*0*	*0*	*184370.47*
	Allowance for Project Manager Support Personnel			1.00	LS	1,544	PCE1	$184,370	$0	$0	$0	$0	$184,370
	Subtotal							$184,370	$0	$0	$0	$0	$184,370
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$184,370**
	Escalation							$24,060	$0	$0	$0	$0	$24,060
	Management Reserve							$15,696	$0	$0	$0	$0	$15,696
---Total	**CR.10.16.02.03 Project Closeout**					**1,544**		**$224,127**	**$0**	**$0**	**$0**	**$0**	**$224,127**

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TTR0001 Quality Assurance - Refurbishments and Upgrades A - OPC

	BEA	*U.C. per EA*				*79.2*	*$130.00*	*10296*	*0*	*0*	*0*	*0*	*10296*
	Inspection Plan Preparation			0.92	EA	73	QA/ENG	$9,472	$0	$0	$0	$0	$9,472
	BEA	*U.C. per EA*				*435.6*	*$130.00*	*56628*	*0*	*0*	*0*	*0*	*56628*
	INL Quality Engineer			0.92	EA	401	QA/ENG	$52,098	$0	$0	$0	$0	$52,098
	BEA	*U.C. per EA*				*297*	*$130.00*	*38610*	*0*	*0*	*0*	*0*	*38610*
	Inspection and Overview			0.92	EA	273	QA/ENG	$35,521	$0	$0	$0	$0	$35,521

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0001 Quality Assurance - Refurbishments and Upgrades A - OPC													
		BEA	*U.C. per EA*			*396*	*$65.00*	*25740*	*0*	*0*	*0*	*0*	*25740*
	Maintain QA Doc. Admin Support			0.92	EA	364	ADM	$23,681	$0	$0	$0	$0	$23,681
	Subtotal							$120,772	$0	$0	$0	$0	$120,772
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$120,772**
	Escalation							$15,761	$0	$0	$0	$0	$15,761
	Management Reserve							$22,195	$0	$0	$0	$0	$22,195
---Total	**TTR0001 Quality Assurance - Refurbishments and Upgrades A - OPC**					**1,111**		**$158,728**	**$0**	**$0**	**$0**	**$0**	**$158,728**
TTR0001 Quality Assurance - Refurbishments and Upgrades B - CAP													
		BEA	*U.C. per EA*			*79.2*	*$130.00*	*10296*	*0*	*0*	*0*	*0*	*10296*
	Inspection Plan Preparation			0.08	EA	6	QA/ENG	$824	$0	$0	$0	$0	$824
		BEA	*U.C. per EA*			*435.6*	*$130.00*	*56628*	*0*	*0*	*0*	*0*	*56628*
	INL Quality Engineer			0.08	EA	35	QA/ENG	$4,530	$0	$0	$0	$0	$4,530
		BEA	*U.C. per EA*			*297*	*$130.00*	*38610*	*0*	*0*	*0*	*0*	*38610*
	Inspection and Overview			0.08	EA	24	QA/ENG	$3,089	$0	$0	$0	$0	$3,089

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0001 Quality Assurance - Refurbishments and Upgrades B - CAP												
	BEA	*U.C. per EA*			*396*	*$65.00*	*25740*	*0*	*0*	*0*	*0*	*25740*
	Maintain QA Doc. Admin Support		0.08	EA	32	ADM	$2,059	$0	$0	$0	$0	$2,059
	Subtotal						$10,502	$0	$0	$0	$0	$10,502
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$10,502**
	Escalation						$1,371	$0	$0	$0	$0	$1,371
	Management Reserve						$1,930	$0	$0	$0	$0	$1,930
---Total	**TTR0001 Quality Assurance - Refurbishments and Upgrades B - CAP**				**97**		**$13,802**	**$0**	**$0**	**$0**	**$0**	**$13,802**
TTR0002 Enviromental Safety and Health Engineering A - OPC												
	BEA	*U.C. per EA*			*396*	*$185.00*	*73260*	*0*	*0*	*0*	*0*	*73260*
	INL Enviromental Safety and Health Engineering		0.92	EA	364	ES&H	$67,399	$0	$0	$0	$0	$67,399
	Subtotal						$67,399	$0	$0	$0	$0	$67,399
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$67,399**
	Escalation						$8,796	$0	$0	$0	$0	$8,796
	Management Reserve						$12,598	$0	$0	$0	$0	$12,598
---Total	**TTR0002 Enviromental Safety and Health Engineering A - OPC**				**364**		**$88,793**	**$0**	**$0**	**$0**	**$0**	**$88,793**
TTR0002 Enviromental Safety and Health Engineering B - CAP												
	BEA	*U.C. per EA*			*396*	*$185.00*	*73260*	*0*	*0*	*0*	*0*	*73260*
	INL Enviromental Safety and Health Engineering		0.08	EA	32	ES&H	$5,861	$0	$0	$0	$0	$5,861

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0002	**Enviromental Safety and Health Engineering B - CAP**											
	Subtotal						$5,861	$0	$0	$0	$0	$5,861
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$5,861**
	Escalation						$765	$0	$0	$0	$0	$765
	Management Reserve						$1,095	$0	$0	$0	$0	$1,095
---Total	**TTR0002 Enviromental Safety and Health Engineering B - CAP**				**32**		**$7,721**	**$0**	**$0**	**$0**	**$0**	**$7,721**
TTR0003	**Radiological Controls A - OPC**											
	BEA	*U.C. per EA*			*396*	*$90.00*	*35640*	*0*	*0*	*0*	*0*	*35640*
	INL Health Physics Technician (Full Time)		0.92	EA	364	HP	$32,789	$0	$0	$0	$0	$32,789
	BEA	*U.C. per EA*			*79.2*	*$90.00*	*7128*	*0*	*0*	*0*	*0*	*7128*
	INL Health Physics Supervisior Support		0.92	EA	73	HP	$6,558	$0	$0	$0	$0	$6,558
	BEA	*U.C. per EA*			*198*	*$145.00*	*28710*	*0*	*0*	*0*	*0*	*28710*
	INL Radiation Engineer		0.92	EA	182	RAD/ENG	$26,413	$0	$0	$0	$0	$26,413
	Subtotal						$65,760	$0	$0	$0	$0	$65,760
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$65,760**
	Escalation						$8,582	$0	$0	$0	$0	$8,582
	Management Reserve						$12,399	$0	$0	$0	$0	$12,399
---Total	**TTR0003 Radiological Controls A - OPC**				**619**		**$86,741**	**$0**	**$0**	**$0**	**$0**	**$86,741**
TTR0003	**Radiological Controls B - CAP**											
	BEA	*U.C. per EA*			*396*	*$90.00*	*35640*	*0*	*0*	*0*	*0*	*35640*
	INL Health Physics Technician (Full Time)		0.08	EA	32	HP	$2,851	$0	$0	$0	$0	$2,851

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0003 Radiological Controls B - CAP												
	BEA	*U.C. per EA*			*79.2*	*$90.00*	*7128*	*0*	*0*	*0*	*0*	*7128*
	INL Health Physics Supervisior Support		0.08	EA	6	HP	$570	$0	$0	$0	$0	$570
	BEA	*U.C. per EA*			*198*	*$145.00*	*28710*	*0*	*0*	*0*	*0*	*28710*
	INL Radiation Engineer		0.08	EA	16	RAD/ENG	$2,297	$0	$0	$0	$0	$2,297
	Subtotal						$5,718	$0	$0	$0	$0	$5,718
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$5,718**
	Escalation						$746	$0	$0	$0	$0	$746
	Management Reserve						$1,078	$0	$0	$0	$0	$1,078
Total	**TTR0003 Radiological Controls B - CAP**				**54**		**$7,543**	**$0**	**$0**	**$0**	**$0**	**$7,543**
CR.10.16.02.03.01 Environmental Support (RCRA)												
	BEA	*U.C. per LS*			*846*	*$200.00*	*169200*	*0*	*0*	*0*	*0*	*169200*
	Allowance for the development of RCRA documents based on historical costs		1.00	LS	846	ENV/ENG	$169,200	$0	$0	$0	$0	$169,200
	Memo: The description "historical" is a term identified in the AREVA estimate.											
	Subtotal						$169,200	$0	$0	$0	$0	$169,200
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$169,200**
	Escalation						$22,081	$0	$0	$0	$0	$22,081
	Management Reserve						$19,128	$0	$0	$0	$0	$19,128
Total	**CR.10.16.02.03.01 Environmental Support (RCRA)**				**846**		**$210,409**	**$0**	**$0**	**$0**	**$0**	**$210,409**

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0012 Security Documentation and Procedures													
	BEA		*U.C. per LS*		NJ12			*0*	*0*	*4050*	*0*	*0*	*4050*
	Allowance for BEA travel to vendors for inspection of proposed equipment			1.00	LS	0		$0	$0	$4,050	$0	$0	$4,050
Memo:	(Assume $1500 each for no more that 3 vendors)												
	BEA		*U.C. per LS*		NJ12			*0*	*0*	*1350*	*0*	*0*	*1350*
	Allowance for BEA travel to vendor for FAT witness testing			1.00	LS	0		$0	$0	$1,350	$0	$0	$1,350
Memo:	(Assume $1500 for the trip)												
	BEA		*U.C. per LS*			*216*	*$165.00*	*35640*	*0*	*0*	*0*	*0*	*35640*
	Review and revise Facility and Building Security plan			1.00	LS	216	SECURITY	$35,640	$0	$0	$0	$0	$35,640
	BEA		*U.C. per LS*			*72*	*$165.00*	*11880*	*0*	*0*	*0*	*0*	*11880*
	Review and revise Facility Access Plan			1.00	LS	72	SECURITY	$11,880	$0	$0	$0	$0	$11,880
	BEA		*U.C. per LS*			*72*	*$165.00*	*11880*	*0*	*0*	*0*	*0*	*11880*
	Review and revise Security Plan for Classified Matter			1.00	LS	72	SECURITY	$11,880	$0	$0	$0	$0	$11,880
	BEA		*U.C. per LS*			*72*	*$165.00*	*11880*	*0*	*0*	*0*	*0*	*11880*
	Review and revise Nuclear Material Control Plan			1.00	LS	72	SECURITY	$11,880	$0	$0	$0	$0	$11,880
	BEA		*U.C. per LS*			*72*	*$165.00*	*11880*	*0*	*0*	*0*	*0*	*11880*
	Review and revise TREAT Security System Operating Procedure			1.00	LS	72	SECURITY	$11,880	$0	$0	$0	$0	$11,880
	Subtotal							$83,160	$0	$5,400	$0	$0	$88,560
	Sales Tax							$0	$0	$324	$0	$0	$324
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$88,884**
	Escalation							$10,852	$0	$747	$0	$0	$11,599
	Management Reserve							$15,625	$0	$1,075	$0	$0	$16,701
---Total	**TTR0012 Security Documentation and Procedures**					**504**		**$109,637**	**$0**	**$7,546**	**$0**	**$0**	**$117,184**

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.17.01.01 TREAT Annual Operations												
Memo:	***Estimate based on information provided by L. Olsen.***											
	BEA	*U.C. per EA*			*35200*	*$275.11*	*9683872*	*0*	*0*	*0*	*0*	*9683872*
	Facility Manager		1.00	EA	35,200	Z04C2	$9,683,872	$0	$0	$0	$0	$9,683,872
	BEA	*U.C. per EA*			*35200*	*$275.11*	*9683872*	*0*	*0*	*0*	*0*	*9683872*
	Supervisor in charge		2.00	EA	70,400	Z04C2	$19,367,744	$0	$0	$0	$0	$19,367,744
	BEA	*U.C. per EA*			*35200*	*$275.11*	*9683872*	*0*	*0*	*0*	*0*	*9683872*
	Reactor Operations Supervisor		2.00	EA	70,400	Z04C2	$19,367,744	$0	$0	$0	$0	$19,367,744
	BEA	*U.C. per EA*			*35200*	*$137.57*	*4842464*	*0*	*0*	*0*	*0*	*4842464*
	Reactor Operator (fuel handling and maintenance support)		3.00	EA	105,600	F05GB	$14,527,392	$0	$0	$0	$0	$14,527,392
	BEA	*U.C. per EA*			*35200*	*$125.35*	*4412320*	*0*	*0*	*0*	*0*	*4412320*
	Electronics Technician		3.00	EA	105,600	T44U1	$13,236,960	$0	$0	$0	$0	$13,236,960
	BEA	*U.C. per EA*			*35200*	*$173.22*	*6097344*	*0*	*0*	*0*	*0*	*6097344*
	Maintenance Supervisor		1.00	EA	35,200	Z02GB	$6,097,344	$0	$0	$0	$0	$6,097,344
	BEA	*U.C. per EA*			*35200*	*$125.35*	*4412320*	*0*	*0*	*0*	*0*	*4412320*
	Maintenance Technician (shared responsibility with qualified reactor operators)		3.00	EA	105,600	T44U1	$13,236,960	$0	$0	$0	$0	$13,236,960
	BEA	*U.C. per EA*			*35200*	*$125.35*	*4412320*	*0*	*0*	*0*	*0*	*4412320*
	Crane Operator and Rigger (shared responsibility with qualified reactor operators)		3.00	EA	105,600	T44U1	$13,236,960	$0	$0	$0	$0	$13,236,960
	BEA	*U.C. per EA*			*35200*	*$193.54*	*6812608*	*0*	*0*	*0*	*0*	*6812608*
	Fissionable Material Handler (shared responsibility with qualified reactor operators)		3.00	EA	105,600	Z03GB	$20,437,824	$0	$0	$0	$0	$20,437,824
	BEA	*U.C. per EA*			*35200*	*$125.35*	*4412320*	*0*	*0*	*0*	*0*	*4412320*
	Radiographers (System Engineer assisted by operators)		1.00	EA	35,200	T44U1	$4,412,320	$0	$0	$0	$0	$4,412,320

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.17.01.01 TREAT Annual Operations												
Memo:	***Estimate based on information provided by L. Olsen.***											
	BEA	*U.C. per EA*			*35200*	*$151.24*	*5323648*	*0*	*0*	*0*	*0*	*5323648*
	Radiation Safety Technicians (depends on operations. 1 only for maintaining thefacility)		1.50	EA	52,800	E54W4	$7,985,472	$0	$0	$0	$0	$7,985,472
	BEA	*U.C. per EA*			*35200*	*$275.11*	*9683872*	*0*	*0*	*0*	*0*	*9683872*
	SORC Chair/ESAP Coordination		1.00	EA	35,200	Z04C2	$9,683,872	$0	$0	$0	$0	$9,683,872
	BEA	*U.C. per EA*			*35200*	*$108.76*	*3828352*	*0*	*0*	*0*	*0*	*3828352*
	Radiation Safety Technicians (depends on operations. 1 only for maintaining thefacility)		1.50	EA	52,800	T13H6	$5,742,528	$0	$0	$0	$0	$5,742,528
	BEA	*U.C. per EA*			*35200*	*$138.64*	*4880128*	*0*	*0*	*0*	*0*	*4880128*
	Quality Assurance Representative (shared responsibility - covers more than justTREAT)		0.50	EA	17,600	E17Q5	$2,440,064	$0	$0	$0	$0	$2,440,064
	BEA	*U.C. per EA*			*35200*	*$111.30*	*3917760*	*0*	*0*	*0*	*0*	*3917760*
	Training Coordinator (tracking training and reminding people to keep up to date)		0.25	EA	8,800	P23GB	$979,440	$0	$0	$0	$0	$979,440
	BEA	*U.C. per EA*			*35200*	*$111.30*	*3917760*	*0*	*0*	*0*	*0*	*3917760*
	Training (maintaining certifications and qualifications)		0.50	EA	17,600	P23GB	$1,958,880	$0	$0	$0	$0	$1,958,880
	BEA	*U.C. per EA*			*35200*	*$151.24*	*5323648*	*0*	*0*	*0*	*0*	*5323648*
	System Engineer (I&C for reactor and experiment controls and monitoring equipment)		1.00	EA	35,200	E54W4	$5,323,648	$0	$0	$0	$0	$5,323,648
	BEA	*U.C. per EA*			*35200*	*$151.24*	*5323648*	*0*	*0*	*0*	*0*	*5323648*
	System Engineer (Nuclear Engineer/Reactor Engineer/Fuel Systems/Safety system compliance/Reactor engineering support/experiment reviews)		1.00	EA	35,200	E54W4	$5,323,648	$0	$0	$0	$0	$5,323,648
	BEA	*U.C. per EA*			*35200*	*$151.24*	*5323648*	*0*	*0*	*0*	*0*	*5323648*
	Facility Engineer (Mechanical for ventilation systems/cranes/fluid systems/structural)		1.00	EA	35,200	E54W4	$5,323,648	$0	$0	$0	$0	$5,323,648

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.17.01.01 TREAT Annual Operations												
Memo:	***Estimate based on information provided by L. Olsen.***											
	BEA	*U.C. per EA*			*35200*	*$151.24*	*5323648*	*0*	*0*	*0*	*0*	*5323648*
	Facility Engineer (Electrical - Emergency diesel generators/electrical distribution/RAMs/CAMs/Lighting)		1.00	EA	35,200	E54W4	$5,323,648	$0	$0	$0	$0	$5,323,648
	BEA	*U.C. per EA*			*35200*	*$176.23*	*6203296*	*0*	*0*	*0*	*0*	*6203296*
	Nuclear Safety Engineering (Support for SAR reviews/USQs/Experiment Reviews/Crit Safety Aspects		0.50	EA	17,600	E14W4	$3,101,648	$0	$0	$0	$0	$3,101,648
	BEA	*U.C. per EA*			*35200*	*$188.53*	*6636256*	*0*	*0*	*0*	*0*	*6636256*
	Production Control (involved when assets external to TREAT are involved)		1.00	EA	35,200	F35P1	$6,636,256	$0	$0	$0	$0	$6,636,256
	BEA	*U.C. per EA*			*35200*	*$120.88*	*4254976*	*0*	*0*	*0*	*0*	*4254976*
	Production Control (Involved when assets external to TREAT are Involved)		1.00	EA	35,200	F33P2	$4,254,976	$0	$0	$0	$0	$4,254,976
	BEA	*U.C. per EA*			*35200*	*$120.60*	*4245120*	*0*	*0*	*0*	*0*	*4245120*
	Work Planner		0.50	EA	17,600	F10J1	$2,122,560	$0	$0	$0	$0	$2,122,560
	BEA	*U.C. per EA*			*35200*	*$151.78*	*5342656*	*0*	*0*	*0*	*0*	*5342656*
	Safety		0.25	EA	8,800	E19H1	$1,335,664	$0	$0	$0	$0	$1,335,664
	BEA	*U.C. per EA*			*35200*	*$148.27*	*5219104*	*0*	*0*	*0*	*0*	*5219104*
	Industrial Hygiene		0.25	EA	8,800	S08H1	$1,304,776	$0	$0	$0	$0	$1,304,776
	BEA	*U.C. per EA*			*35200*	*$64.32*	*2264064*	*0*	*0*	*0*	*0*	*2264064*
	Document Records and Admin		1.00	EA	35,200	A14GB	$2,264,064	$0	$0	$0	$0	$2,264,064
	BEA	*U.C. per $*		NM80			*0*	*0*	*0*	*10000*	*0*	*10000*
	Consultants, Services Subcontracts, Advisory Panel		2.00	$	0		$0	$0	$0	$20,000	$0	$20,000
	BEA	*U.C. per $*					*40*	*0*	*0*	*0*	*0*	*40*
	Nominal Travel		20,000.00	$	0		$800,000	$0	$0	$0	$0	$800,000

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.17.01.01 TREAT Annual Operations												
Memo:	***Estimate based on information provided by L. Olsen.***											
	BEA	*U.C. per years*		NM60			*0*	*0*	*75000*	*0*	*0*	*75000*
	Office Materials		40.00	years	0		$0	$0	$3,000,000	$0	$0	$3,000,000
Memo: This is based on 40 years of operation running halftime. Based on running 10 experiments a year.												
	BEA	*U.C. per years*		NM60			*0*	*0*	*350000*	*0*	*0*	*350000*
	Maintenance System Parts and Equipment		40.00	years	0		$0	$0	$14,000,000	$0	$0	$14,000,000
	BEA	*U.C. per years*		NM60			*0*	*0*	*150000*	*0*	*0*	*150000*
	Operations and Maintenance Materials		40.00	years	0		$0	$0	$6,000,000	$0	$0	$6,000,000
	BEA	*U.C. per $*		NM80			*0*	*0*	*40*	*0*	*0*	*40*
	Electricity		154,000.00	$	0		$0	$0	$6,160,000	$0	$0	$6,160,000
	Subtotal						$**,***,***	$0	$29,160,000	$20,000	$0	$234,689,912
	Sales Tax						$0	$0	$1,749,600	$0	$0	$1,749,600
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$236,439,512**
	Escalation						$**,***,***	$0	$36,995,700	$23,938	$0	$282,994,452
	Management Reserve						$0	$0	$0	$0	$0	$0
---Total	**CR.10.17.01.01 TREAT Annual Operations**			**1,258,400**			**$**,***,*** **	**$0**	**$67,905,300**	**$43,938**	**$0**	**$519,433,964**
CR.10.18.01 Scientific Coordinator												
E14C2	BEA	*U.C. per FTE*			*70400*	*$211.67*	*14901568*	*0*	*0*	*0*	*0*	*14901568*
	NUCLEAR/REACTOR ENGINEERING		1.00	FTE	70,400	E14C2	$14,901,568	$0	$0	$0	$0	$14,901,568
Memo: This allowance is for one full time FTE to support TREAT Restart activities.												

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.18.01 Scientific Coordinator												
	Subtotal						$14,901,568	$0	$0	$0	$0	$14,901,568
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$14,901,568**
	Escalation						$17,835,687	$0	$0	$0	$0	$17,835,687
	Management Reserve						$6,547,451	$0	$0	$0	$0	$6,547,451
---Total	**CR.10.18.01 Scientific Coordinator**				**70,400**		**$39,284,706**	**$0**	**$0**	**$0**	**$0**	**$39,284,706**
D&D												
C-119		BEA	*U.C. per Sqft*				*221*	*0*	*0*	*0*	*0*	*221*
	Reactor D&D		22,500.00	Sqft	0		$4,972,500	$0	$0	$0	$0	$4,972,500
	Subtotal						$4,972,500	$0	$0	$0	$0	$4,972,500
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$4,972,500**
	Escalation						$15,557,958	$0	$0	$0	$0	$15,557,958
	Management Reserve						$0	$0	$0	$0	$0	$0
---Total	**D&D**				**0**		**$20,530,458**	**$0**	**$0**	**$0**	**$0**	**$20,530,458**
CR.10.17.02 Apply BEA Material G&A												
		BEA	*U.C. per mat$*	NT20			*0*	*0*	*0.15*	*0*	*0*	*0.15*
	Material G&A during		24,036,533.00	mat$	0		$0	$0	$3,605,480	$0	$0	$3,605,480

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.17.02 Apply BEA Material G&A												
Subtotal							$0	$0	$3,605,480	$0	$0	$3,605,480
Sales Tax							$0	$0	$0	$0	$0	$0
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$3,605,480**
Escalation							$0	$0	$4,315,399	$0	$0	$4,315,399
Management Reserve							$0	$0	$0	$0	$0	$0
---Total CR.10.17.02 Apply BEA Material G&A					**0**		**$0**	**$0**	**$7,920,879**	**$0**	**$0**	**$7,920,879**
CR.10.17.03 Apply Subcontracts G&A												
BEA		*U.C. per Subc$*		NT21			*0*	*0*	*0.029*	*0*	*0*	*0.029*
Subcontract G&A			20,000.00	Subc$	0		$0	$0	$580	$0	$0	$580
Subtotal							$0	$0	$580	$0	$0	$580
Sales Tax							$0	$0	$0	$0	$0	$0
Markups		0.00%					$0	$0	$0	$0	$0	$0
Subtotal Estimate												**$580**
Escalation							$0	$0	$694	$0	$0	$694
Management Reserve							$0	$0	$0	$0	$0	$0
---Total CR.10.17.03 Apply Subcontracts G&A					**0**		**$0**	**$0**	**$1,274**	**$0**	**$0**	**$1,274**
001 Design Loop Control Module System												
BEA		*U.C. per EA*			*600*	*$195.00*	*117000*	*0*	*0*	*0*	*0*	*117000*
Develop a functional specification for LCM			1.00	EA	600	DE/ENG	$117,000	$0	$0	$0	$0	$117,000
BEA		*U.C. per EA*			*1000*	*$195.00*	*195000*	*0*	*0*	*0*	*0*	*195000*
INL Design new PLC system			1.00	EA	1,000	DE/ENG	$195,000	$0	$0	$0	$0	$195,000
BEA		*U.C. per EA*			*500*	*$195.00*	*97500*	*0*	*0*	*0*	*0*	*97500*
INL sofware engineering/coding			1.00	EA	500	DE/ENG	$97,500	$0	$0	$0	$0	$97,500

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
001 Design Loop Control Module System													
		BEA	*U.C. per EA*			*40*	*$180.00*	*7200*	*0*	*0*	*0*	*0*	*7200*
	V&V Software Test Plan			1.00	EA	40	SYSENG	$7,200	$0	$0	$0	$0	$7,200
		BEA	*U.C. per EA*			*120*	*$180.00*	*21600*	*0*	*0*	*0*	*0*	*21600*
	V&V Software Test Procedure			1.00	EA	120	SYSENG	$21,600	$0	$0	$0	$0	$21,600
		BEA	*U.C. per EA*			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	V&V Software Plan/Procedure review (Design Review)			1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400
		BEA	*U.C. per EA*			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	V&V Procedure Execution			1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400
	Subtotal							$467,100	$0	$0	$0	$0	$467,100
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$467,100**
	Escalation							$60,957	$0	$0	$0	$0	$60,957
	Management Reserve							$39,260	$0	$0	$0	$0	$39,260
Total	**001 Design Loop Control Module System**					**2,420**		**$567,317**	**$0**	**$0**	**$0**	**$0**	**$567,317**
002 Drawings and Documentation													
		BEA	*U.C. per LS*			*600*	*$180.00*	*108000*	*0*	*0*	*0*	*0*	*108000*
	INL Design Engineer			1.00	LS	600	DE/ENG1	$108,000	$0	$0	$0	$0	$108,000
		BEA	*U.C. per Dwgs*			*40*	*$100.00*	*4000*	*0*	*0*	*0*	*0*	*4000*
	INL Drafter (20 Sheets)			20.00	Dwgs	800	DRAFT	$80,000	$0	$0	$0	$0	$80,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
002 Drawings and Documentation													
	BEA	*U.C. per LS*				*300*	*$90.00*	*27000*	*0*	*0*	*0*	*0*	*27000*
	INL Tech Editor			1.00	LS	300	TECH/EDIT	$27,000	$0	$0	$0	$0	$27,000
	Subtotal							$215,000	$0	$0	$0	$0	$215,000
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$215,000**
	Escalation							$28,058	$0	$0	$0	$0	$28,058
	Management Reserve							$18,313	$0	$0	$0	$0	$18,313
---Total 002 Drawings and Documentation						**1,700**		**$261,370**	**$0**	**$0**	**$0**	**$0**	**$261,370**
003 Procurement													
	BEA	*U.C. per LS*				*200*	*$90.00*	*18000*	*0*	*0*	*0*	*0*	*18000*
	INL Procurement			1.00	LS	200	PROC	$18,000	$0	$0	$0	$0	$18,000
	BEA	*U.C. per LS*		NJ12				*0*	*0*	*4500*	*0*	*0*	*4500*
	Allowance for BEA travel to vendors for inspection of proposed equipment			1.00	LS	0		$0	$0	$4,500	$0	$0	$4,500
Memo:	Assume $1500 each for no more that 3 vendors												
	BEA	*U.C. per LS*		NJ12				*0*	*0*	*1500*	*0*	*0*	*1500*
	Allowance for BEA travel to vendor FAT witness testing			1.00	LS	0		$0	$0	$1,500	$0	$0	$1,500
Memo:	Assume $1500 for the trip												
	BEA	*U.C. per LS*				*200*	*$180.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
	INL Design Engineer			1.00	LS	200	DE/ENG1	$36,000	$0	$0	$0	$0	$36,000
	BEA	*U.C. per LS*				*40*	*$65.00*	*2600*	*0*	*0*	*0*	*0*	*2600*
	INL Admin, Doc. control			1.00	LS	40	ADM	$2,600	$0	$0	$0	$0	$2,600

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
003 Procurement													
EST		BEA	*U.C. per LS*			*40*	*$150.00*	*6000*	*0*	*0*	*0*	*0*	*6000*
	Cost Estimating support		1.00	LS		40	EST	$6,000	$0	$0	$0	$0	$6,000
	Subtotal							$62,600	$0	$6,000	$0	$0	$68,600
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$68,600**
	Escalation							$8,169	$0	$783	$0	$0	$8,952
	Management Reserve							$5,012	$0	$480	$0	$0	$5,492
—Total 003 Procurement						**480**		**$75,781**	**$0**	**$7,263**	**$0**	**$0**	**$83,044**
004 Installation and Testing													
		BEA	*U.C. per EA*		NM60	*24*	*$105.00*	*2520*	*0*	*40000*	*0*	*0*	*42520*
	HMI units		1.00	EA		24	IT/TEC	$2,520	$0	$40,000	$0	$0	$42,520
		BEA	*U.C. per LS*		NM60	*80*	*$105.00*	*8400*	*0*	*100000*	*0*	*0*	*108400*
	PLC Hardware		1.00	LS		80	IT/TEC	$8,400	$0	$100,000	$0	$0	$108,400
		BEA	*U.C. per LS*		NM60	*200*	*$105.00*	*21000*	*0*	*10000*	*0*	*0*	*31000*
	PLC Software		1.00	LS		200	IT/TEC	$21,000	$0	$10,000	$0	$0	$31,000
		BEA	*U.C. per LS*		NM60			*0*	*0*	*10000*	*0*	*0*	*10000*
	Variable Power Drives		1.00	LS		0		$0	$0	$10,000	$0	$0	$10,000
		BEA	*U.C. per LS*		NM60			*0*	*0*	*20000*	*0*	*0*	*20000*
	Variable Frequency Drives		1.00	LS		0		$0	$0	$20,000	$0	$0	$20,000
		BEA	*U.C. per LS*		NM60			*0*	*0*	*30000*	*0*	*0*	*30000*
	Additional power supplied blowers, etc.		1.00	LS		0		$0	$0	$30,000	$0	$0	$30,000
		BEA	*U.C. per EA*		NM60			*0*	*0*	*20000*	*0*	*0*	*20000*
	Misc hardware (custom cabinets, terminal blocks wire, button, meters, etc)		1.00	EA		0		$0	$0	$20,000	$0	$0	$20,000

C-1234

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
004 Installation and Testing													
	BEA	*U.C. per LS*				*200*	*$195.00*	*39000*	*0*	*0*	*0*	*0*	*39000*
	INL Design Engineer, write test plan			1.00	LS	200	DE/ENG	$39,000	$0	$0	$0	$0	$39,000
	BEA	*U.C. per EA*				*500*	*$95.00*	*47500*	*0*	*0*	*0*	*0*	*47500*
	Technician install and test equipment			1.00	EA	500	CRAFT	$47,500	$0	$0	$0	$0	$47,500
	BEA	*U.C. per EA*				*400*	*$195.00*	*78000*	*0*	*0*	*0*	*0*	*78000*
	INL design engineer, system testing			1.00	EA	400	DE/ENG	$78,000	$0	$0	$0	$0	$78,000
	Subtotal							$196,420	$0	$230,000	$0	$0	$426,420
	Sales Tax							$0	$0	$13,800	$0	$0	$13,800
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$440,220**
	Escalation							$25,633	$0	$31,816	$0	$0	$57,449
	Management Reserve							$15,755	$0	$19,555	$0	$0	$35,309
---Total	**004 Installation and Testing**					**1,404**		**$237,807**	**$0**	**$295,171**	**$0**	**$0**	**$532,978**
005 Work Package Planning													
	BEA	*U.C. per LS*				*80*	*$120.00*	*9600*	*0*	*0*	*0*	*0*	*9600*
	INL Planner			1.00	LS	80	PLANNER	$9,600	$0	$0	$0	$0	$9,600
	Subtotal							$9,600	$0	$0	$0	$0	$9,600
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$9,600**
	Escalation							$1,253	$0	$0	$0	$0	$1,253
	Management Reserve							$803	$0	$0	$0	$0	$803
---Total	**005 Work Package Planning**					**80**		**$11,656**	**$0**	**$0**	**$0**	**$0**	**$11,656**

C-124

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0023 Hodoscope Design Engineering												
	BEA	*U.C. per EA*			*2000*	*$205.00*	*410000*	*0*	*0*	*0*	*0*	*410000*
	Specification for the Hodoscope system		1.00	EA	2,000	NU/ENG	$410,000	$0	$0	$0	$0	$410,000
	BEA	*U.C. per EA*			*400*	*$205.00*	*82000*	*0*	*0*	*0*	*0*	*82000*
	Design Architecture and select hardware		1.00	EA	400	NU/ENG	$82,000	$0	$0	$0	$0	$82,000
	BEA	*U.C. per EA*			*400*	*$205.00*	*82000*	*0*	*0*	*0*	*0*	*82000*
	Reverse engineering of cards		1.00	EA	400	NU/ENG	$82,000	$0	$0	$0	$0	$82,000
	BEA	*U.C. per EA*			*1000*	*$205.00*	*205000*	*0*	*0*	*0*	*0*	*205000*
	Design of cabinet (10) layout, wiring drawings		1.00	EA	1,000	NU/ENG	$205,000	$0	$0	$0	$0	$205,000
	BEA	*U.C. per EA*			*30*	*$205.00*	*6150*	*0*	*0*	*0*	*0*	*6150*
	Reverse engineering of 80 software modules		80.00	EA	2,400	NU/ENG	$492,000	$0	$0	$0	$0	$492,000
	BEA	*U.C. per EA*			*600*	*$205.00*	*123000*	*0*	*0*	*0*	*0*	*123000*
	Write software requirements spec		1.00	EA	600	NU/ENG	$123,000	$0	$0	$0	$0	$123,000
	BEA	*U.C. per EA*			*600*	*$205.00*	*123000*	*0*	*0*	*0*	*0*	*123000*
	Write software design description		1.00	EA	600	NU/ENG	$123,000	$0	$0	$0	$0	$123,000
	BEA	*U.C. per EA*			*400*	*$205.00*	*82000*	*0*	*0*	*0*	*0*	*82000*
	Program Hodoscope computers		1.00	EA	400	NU/ENG	$82,000	$0	$0	$0	$0	$82,000
	BEA	*U.C. per EA*			*200*	*$205.00*	*41000*	*0*	*0*	*0*	*0*	*41000*
	Installation Supervision (Engineering)		1.00	EA	200	NU/ENG	$41,000	$0	$0	$0	$0	$41,000
	BEA	*U.C. per EA*			*800*	*$205.00*	*164000*	*0*	*0*	*0*	*0*	*164000*
	Write test Spec and test procedures		1.00	EA	800	NU/ENG	$164,000	$0	$0	$0	$0	$164,000
	BEA	*U.C. per EA*			*200*	*$205.00*	*41000*	*0*	*0*	*0*	*0*	*41000*
	Test Supervision engineering		1.00	EA	200	NU/ENG	$41,000	$0	$0	$0	$0	$41,000
	BEA	*U.C. per EA*			*1000*	*$95.00*	*95000*	*0*	*0*	*0*	*0*	*95000*
	Install and test new system (Technician)		1.00	EA	1,000	CRAFT	$95,000	$0	$0	$0	$0	$95,000

Memo: It is assumed that current cabinets are gutted and new hardware/software/wiring is installed.

C-125

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0023 Hodoscope Design Engineering													
		BEA	*U.C. per EA*			*240*	*$205.00*	*49200*	*0*	*0*	*0*	*0*	*49200*
	Revise procedures for removal/installation of North HODOSCOPE			1.00	EA	240	NU/ENG	$49,200	$0	$0	$0	$0	$49,200
		BEA	*U.C. per EA*			*40*	*$90.00*	*3600*	*0*	*0*	*0*	*0*	*3600*
	Technical Editor			1.00	EA	40	TECH/EDIT	$3,600	$0	$0	$0	$0	$3,600
		BEA	*U.C. per EA*			*40*	*$180.00*	*7200*	*0*	*0*	*0*	*0*	*7200*
	V&V Software Test Plan			1.00	EA	40	SYSENG	$7,200	$0	$0	$0	$0	$7,200
		BEA	*U.C. per EA*			*120*	*$180.00*	*21600*	*0*	*0*	*0*	*0*	*21600*
	V&V Software Test Procedure			1.00	EA	120	SYSENG	$21,600	$0	$0	$0	$0	$21,600
		BEA	*U.C. per EA*			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	V&V Software Plan/Procedure review (Design Review)			1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400
		BEA	*U.C. per EA*			*80*	*$180.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	V&V Procedure Execution			1.00	EA	80	SYSENG	$14,400	$0	$0	$0	$0	$14,400
	Subtotal							$2,050,400	$0	$0	$0	$0	$2,050,400
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$2,050,400**
	Escalation							$267,577	$0	$0	$0	$0	$267,577
	Management Reserve							$176,166	$0	$0	$0	$0	$176,166
---Total	**TTR0023 Hodoscope Design Engineering**					**10,600**		**$2,494,143**	**$0**	**$0**	**$0**	**$0**	**$2,494,143**
TTR0024 Specifications for Procurement													
		BEA	*U.C. per LS*			*80*	*$205.00*	*16400*	*0*	*0*	*0*	*0*	*16400*
	Write procurement specifications for photo-multiplier detectors			1.00	LS	80	NU/ENG	$16,400	$0	$0	$0	$0	$16,400

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0024 Specifications for Procurement												
	BEA	*U.C. per EA*			*500*	*$205.00*	*102500*	*0*	*0*	*0*	*0*	*102500*
	Hodoscope System		1.00	EA	500	NU/ENG	$102,500	$0	$0	$0	$0	$102,500
Memo: Prepare procurement specification for Hodoscope Hardware and Software												
	BEA	*U.C. per LS*		NJ12			*0*	*0*	*4500*	*0*	*0*	*4500*
	Allowance for BEA travel to vendors for inspection of proposed equipment		1.00	LS	0		$0	$0	$4,500	$0	$0	$4,500
Memo: (Assume $1500 each for no more that 3 vendors)												
	BEA	*U.C. per LS*		NJ12			*0*	*0*	*1500*	*0*	*0*	*1500*
	Allowance for BEA travel to vendor for FAT witness testing		1.00	LS	0		$0	$0	$1,500	$0	$0	$1,500
Memo: (Assume $1500 for the trip)												
	BEA	*U.C. per LS*		NM60			*0*	*0*	*450000*	*0*	*0*	*450000*
	Computer/data storage/communication hardware ($400,000+/-$50,000)		1.00	LS	0		$0	$0	$450,000	$0	$0	$450,000
	BEA	*U.C. per LS*		NM60			*0*	*0*	*24000*	*0*	*0*	*24000*
	Power supplies similar to HVDC ($20,000 +/- $4,000)		1.00	LS	0		$0	$0	$24,000	$0	$0	$24,000
	BEA	*U.C. per LS*		NM60			*0*	*0*	*1000000*	*0*	*0*	*1000000*
	New circuit cards for amplifiers, scalers ($800,000 +/- $200,000)		1.00	LS	0		$0	$0	$1,000,000	$0	$0	$1,000,000
Memo: (About 800 cards at $1000/card - $800,000 +/- $200,000)												

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0024 Specifications for Procurement													
		BEA	*U.C. per LS*		NM60			*0*	*0*	*550000*	*0*	*0*	*550000*
	New switches, indicators, cabinets, wiring ($500,000 +/- $50,000)			1.00	LS	0		$0	$0	$550,000	$0	$0	$550,000
Memo:	Ten Cabinets ($500,000 +/- $50,000)												
	Subtotal							$118,900	$0	$2,030,000	$0	$0	$2,148,900
	Sales Tax							$0	$0	$121,800	$0	$0	$121,800
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$2,270,700**
	Escalation							$15,516	$0	$280,810	$0	$0	$296,326
	Management Reserve							$10,392	$0	$188,077	$0	$0	$198,469
---Total	**TTR0024 Specifications for Procurement**					**580**		**$144,809**	**$0**	**$2,620,686**	**$0**	**$0**	**$2,765,495**
TTR0025 Replace Photo-Multiplier Detectors													
		BEA	*U.C. per EA*		NM60	*1456*	*$90.00*	*131040*	*0*	*105560*	*0*	*0*	*236600*
	Procure detectors			1.00	EA	1,456	PROC	$131,040	$0	$105,560	$0	$0	$236,600
		BEA	*U.C. per LS*			*180*	*$95.00*	*17100*	*0*	*0*	*0*	*0*	*17100*
	Replace detectors			1.00	LS	180	CRAFT	$17,100	$0	$0	$0	$0	$17,100
		BEA	*U.C. per LS*		NJ12			*0*	*0*	*4500*	*0*	*0*	*4500*
	Allowance for BEA travel to vendors for inspection of proposed equipment			1.00	LS	0		$0	$0	$4,500	$0	$0	$4,500
Memo:	(Assume $1500 each for no more that 3 vendors)												

C-128

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0025 Replace Photo-Multiplier Detectors												
	BEA	*U.C. per LS*		NJ12			*0*	*0*	*1500*	*0*	*0*	*1500*
	Allowance for BEA travel to vendor for FAT witness testing		1.00	LS	0		$0	$0	$1,500	$0	$0	$1,500
Memo: (Assume $1500 for the trip)												
	Subtotal						$148,140	$0	$111,560	$0	$0	$259,700
	Sales Tax						$0	$0	$6,694	$0	$0	$6,694
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$266,394**
	Escalation						$19,332	$0	$15,432	$0	$0	$34,764
	Management Reserve						$12,547	$0	$10,016	$0	$0	$22,563
—Total	**TTR0025 Replace Photo-Multiplier Detectors**				**1,636**		**$180,019**	**$0**	**$143,701**	**$0**	**$0**	**$323,721**

C-129

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0026 Detector Functional Tests												
	BEA	*U.C. per LS*			*80*	*$95.00*	*7600*	*0*	*0*	*0*	*0*	*7600*
	Detector Functional Testing		1.00	LS	80	CRAFT	$7,600	$0	$0	$0	$0	$7,600
	Subtotal						$7,600	$0	$0	$0	$0	$7,600
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$7,600**
	Escalation						$992	$0	$0	$0	$0	$992
	Management Reserve						$631	$0	$0	$0	$0	$631
—Total	**TTR0026 Detector Functional Tests**				**80**		**$9,223**	**$0**	**$0**	**$0**	**$0**	**$9,223**

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0027 Platform and Source Positioning Tests												
	BEA	*U.C. per LS*			*120*	*$95.00*	*11400*	*0*	*0*	*0*	*0*	*11400*
	Testing		1.00	LS	120	CRAFT	$11,400	$0	$0	$0	$0	$11,400

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0027 Platform and Source Positioning Tests												
	Subtotal						$11,400	$0	$0	$0	$0	$11,400
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$11,400**
	Escalation						$1,488	$0	$0	$0	$0	$1,488
	Management Reserve						$993	$0	$0	$0	$0	$993
---Total	**TTR0027 Platform and Source Positioning Tests**				**120**		**$13,880**	**$0**	**$0**	**$0**	**$0**	**$13,880**
TTR0028 Refurbishment of Detectors												
	BEA	*U.C. per ea*			*1*	*$95.00*	*95*	*0*	*0*	*0*	*0*	*95*
	Refurbishment of detectors		720.00	ea	720	CRAFT	$68,400	$0	$0	$0	$0	$68,400
	Subtotal						$68,400	$0	$0	$0	$0	$68,400
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$68,400**
	Escalation						$8,926	$0	$0	$0	$0	$8,926
	Management Reserve						$5,682	$0	$0	$0	$0	$5,682
---Total	**TTR0028 Refurbishment of Detectors**				**720**		**$83,009**	**$0**	**$0**	**$0**	**$0**	**$83,009**
TTR0029 Revise Drawings and Specifications												
	BEA	*U.C. per LS*			*1200*	*$195.00*	*234000*	*0*	*0*	*0*	*0*	*234000*
	Drawings and documentation (new detailed user Manual)		1.00	LS	1,200	DE/ENG	$234,000	$0	$0	$0	$0	$234,000

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0029 Revise Drawings and Specifications												
	BEA	*U.C. per Dwgs*			*40*	*$100.00*	*4000*	*0*	*0*	*0*	*0*	*4000*
	INL Drafting (Assume 40 sheets)		40.00	Dwgs	1,600	DRAFT	$160,000	$0	$0	$0	$0	$160,000
	Subtotal						$394,000	$0	$0	$0	$0	$394,000
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$394,000**
	Escalation						$51,417	$0	$0	$0	$0	$51,417
	Management Reserve						$33,657	$0	$0	$0	$0	$33,657
---Total	**TTR0029 Revise Drawings and Specifications**				**2,800**		**$479,074**	**$0**	**$0**	**$0**	**$0**	**$479,074**
TTR0030 Work Package Planning												
	BEA	*U.C. per EA*			*120*	*$120.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	INL Planner		1.00	EA	120	PLANNER	$14,400	$0	$0	$0	$0	$14,400
	Subtotal						$14,400	$0	$0	$0	$0	$14,400
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$14,400**
	Escalation						$1,879	$0	$0	$0	$0	$1,879
	Management Reserve						$1,205	$0	$0	$0	$0	$1,205
---Total	**TTR0030 Work Package Planning**				**120**		**$17,484**	**$0**	**$0**	**$0**	**$0**	**$17,484**
TTR0071 Experiment Safety Analysis												
	BEA	*U.C. per EA*			*320*	*$205.00*	*65600*	*0*	*0*	*0*	*0*	*65600*
	Write experimental safety analysis document		1.00	EA	320	NU/ENG	$65,600	$0	$0	$0	$0	$65,600
	BEA	*U.C. per EA*			*120*	*$205.00*	*24600*	*0*	*0*	*0*	*0*	*24600*
	Review and approve experiment safety analysis document		1.00	EA	120	NU/ENG	$24,600	$0	$0	$0	$0	$24,600

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0071 Experiment Safety Analysis													
	BEA	*U.C. per EA*				*960*	*$205.00*	*196800*	*0*	*0*	*0*	*0*	*196800*
	Develop neutronics model of TREAT core			1.00	EA	960	NU/ENG	$196,800	$0	$0	$0	$0	$196,800
	BEA	*U.C. per EA*				*200*	*$205.00*	*41000*	*0*	*0*	*0*	*0*	*41000*
	Review and approve nuetronics model			1.00	EA	200	NU/ENG	$41,000	$0	$0	$0	$0	$41,000
	BEA	*U.C. per EA*				*960*	*$205.00*	*196800*	*0*	*0*	*0*	*0*	*196800*
	Develop transient thermal hydraulic model of test			1.00	EA	960	NU/ENG	$196,800	$0	$0	$0	$0	$196,800
	BEA	*U.C. per EA*				*200*	*$205.00*	*41000*	*0*	*0*	*0*	*0*	*41000*
	Review and approve thermal hydraulic model			1.00	EA	200	NU/ENG	$41,000	$0	$0	$0	$0	$41,000
	BEA	*U.C. per EA*				*960*	*$205.00*	*196800*	*0*	*0*	*0*	*0*	*196800*
	Develop validated fuel pin energy deposition model			1.00	EA	960	NU/ENG	$196,800	$0	$0	$0	$0	$196,800
	BEA	*U.C. per EA*				*200*	*$205.00*	*41000*	*0*	*0*	*0*	*0*	*41000*
	Review and approve fuel pin energy deposition model			1.00	EA	200	NU/ENG	$41,000	$0	$0	$0	$0	$41,000
	BEA	*U.C. per LS*				*200*	*$120.00*	*24000*	*0*	*0*	*0*	*0*	*24000*
	INL Planner			1.00	LS	200	PLANNER	$24,000	$0	$0	$0	$0	$24,000
	BEA	*U.C. per EA*						*250000*	*0*	*0*	*0*	*0*	*250000*
	Allowance to test and refurbish test loops			1.00	EA	0		$250,000	$0	$0	$0	$0	$250,000
	Subtotal							$1,077,600	$0	$0	$0	$0	$1,077,600
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$1,077,600**
	Escalation							$140,627	$0	$0	$0	$0	$140,627
	Management Reserve							$90,268	$0	$0	$0	$0	$90,268
---Total	**TTR0071 Experiment Safety Analysis**					**4,120**		**$1,308,494**	**$0**	**$0**	**$0**	**$0**	**$1,308,494**

DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
TTR0072 Guide for Irradiation Experiments													
	BEA	U.C. per LS				*600*	*$205.00*	*123000*	*0*	*0*	*0*	*0*	*123000*
	INL Analyst Engineer/Nuc/Rx develop guide and incorporate comments			1.00	LS	600	NU/ENG	$123,000	$0	$0	$0	$0	$123,000
	BEA	U.C. per LS				*200*	*$205.00*	*41000*	*0*	*0*	*0*	*0*	*41000*
	INL Operations Manager review			1.00	LS	200	OPR/MGR	$41,000	$0	$0	$0	$0	$41,000
	BEA	U.C. per LS				*200*	*$180.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
	Operations Engineer review			1.00	LS	200	OPR/ENG	$36,000	$0	$0	$0	$0	$36,000
	BEA	U.C. per LS				*800*	*$120.00*	*96000*	*0*	*0*	*0*	*0*	*96000*
	INL Reactor Operator			1.00	LS	800	RE/OPR	$96,000	$0	$0	$0	$0	$96,000
	BEA	U.C. per LS				*100*	*$90.00*	*9000*	*0*	*0*	*0*	*0*	*9000*
	Tech editor			1.00	LS	100	TECH/EDIT	$9,000	$0	$0	$0	$0	$9,000
	Subtotal							$305,000	$0	$0	$0	$0	$305,000
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$305,000**
	Escalation							$39,803	$0	$0	$0	$0	$39,803
	Management Reserve							$55,312	$0	$0	$0	$0	$55,312
---Total TTR0072 Guide for Irradiation Experiments						**1,900**		**$400,115**	**$0**	**$0**	**$0**	**$0**	**$400,115**
CR.10.18.01.02 Scientific Coordinator													
E14C2	BEA	U.C. per FTE				*8800*	*$211.67*	*1862696*	*0*	*0*	*0*	*0*	*1862696*
	NUCLEAR/REACTOR ENGINEERING			1.00	FTE	8,800	E14C2	$1,862,696	$0	$0	$0	$0	$1,862,696
Memo: This allowance is for one full time FTE to support TREAT Restart activities.													

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DETAIL ITEM REPORT

Project Name: ***RTT Program - TREAT***

Project Location: ***MFC***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.18.01.02	**Scientific Coordinator**											
	Subtotal						$1,862,696	$0	$0	$0	$0	$1,862,696
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$1,862,696**
	Escalation						$243,082	$0	$0	$0	$0	$243,082
	Management Reserve						$421,156	$0	$0	$0	$0	$421,156
	---Total CR.10.18.01.02 Scientific Coordinator				**8,800**		**$2,526,933**	**$0**	**$0**	**$0**	**$0**	**$2,526,933**
CR.10.18.02	**Apply BEA Material G&A**											
	BEA	*U.C. per mat$*	NT20				*0*	*0*	*0.15*	*0*	*0*	*0.15*
	Material G&A during Execution		236,000.00	mat$	0		$0	$0	$35,400	$0	$0	$35,400
	Subtotal						$0	$0	$35,400	$0	$0	$35,400
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$35,400**
	Escalation						$0	$0	$4,620	$0	$0	$4,620
	Management Reserve						$0	$0	$0	$0	$0	$0
	---Total CR.10.18.02 Apply BEA Material G&A				**0**		**$0**	**$0**	**$40,020**	**$0**	**$0**	**$40,020**
	Subtotal RTT Program - TREAT						**$**,***,*** **	**$35,000**	**$40,439,404**	**$1,408,600**	**$0**	**$315,487,062**
	Sales Tax						**$0**	**$0**	**$2,100,370**	**$0**	**$0**	**$2,100,370**
	Markups						**$370,159**	**$10,483**	**$2,465**	**$58,119**	**$0**	**$441,226**
	Subtotal Estimate											**$318,028,659**
	Escalation						**$**,***,*** **	**$5,936**	**$42,402,205**	**$212,735**	**$0**	**$327,560,450**
	Management Reserve						**$10,249,403**	**$4,502**	**$844,169**	**$36,670**	**$0**	**$11,134,745**
	Total RTT Program - TREAT				**1,619,969**		**$569,163,196**	**$55,921**	**$85,788,613**	**$1,716,124**	**$0**	**$656,723,854**

Summary Report

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Project Number: ***1C40-K***

ESTIMATE ELEMENT	Estimate Subtotal	Escalation	Management Reserve	TOTAL
		22.94%	*17.56%*	
Total Estimated Cost (TEC)	$160,639,634	$36,854,504	$34,671,528	$232,165,666
		117.65%	*0.23%*	
Other Project Cost (OPC)	$229,659,641	$270,186,520	$1,170,462	$501,016,623
		78.67%	*5.14%*	
Total Cost	$390,299,275	$307,041,025	$35,841,990	$733,182,290
Rounded Total Cost (Rounded to the nearest $ 1000000)				$733,000,000

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		Remarks
Type of Estimate:	Preliminary Class 5	
Estimator:	A. W. Miller	
Checked By:	SMW for Ross Allen	
Approved By:		

Project Summary Report

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Level	Group	Description	Estimate Subtotal	Escalation	Management Reserve MR	MR %	TOTAL
		ACRR Transient Testing Operations & Intergration	**$390,299,275**	**$307,041,025**	**$35,841,990**	**5.14%**	**$733,182,290**
		. . . . Resumption of Transient Testing Program	**$134,451,624**	**$16,776,027**	**$26,384,471**	**17.45%**	**$177,612,122**
CR.10.16.01	OPC	**. . . . . Actuals From FY11 to FY13 and Projected work in 2013**	**$5,899,691**	**$0**	**$0**	**0.00%**	**$5,899,691**
3.01.01		**. . . . . ACRR New Construction**	**$123,026,708**	**$16,054,985**	**$25,359,589**	**18.23%**	**$164,441,282**
3.01.01.01		. . . . . Capital Line Item Project 413 Documentation Requirments	$22,591,856	$2,948,237	$0	0.00%	$25,540,093
3.01.01.02		. . . . . Construct New Hot Cell	$100,434,852	$13,106,748	$25,359,589	22.34%	$138,901,189
3.01.01.02.01		*. . . . . Hot Cell*	*$62,351,000*	*$8,136,806*	*$14,097,561*	*20.00%*	*$84,585,367*
3.01.01.02.02		*. . . . . Internal Support Equipment*	*$3,975,000*	*$518,738*	*$2,786,117*	*62.00%*	*$7,279,855*
		. . . . . External Equipment Support Systems	*$32,500,000*	*$4,241,250*	*$7,348,250*	*20.00%*	*$44,089,500*
3.01.01.02.03		*. . . . . Par Manipulator*	*$1,590,000*	*$207,495*	*$1,114,447*	*62.00%*	*$2,911,942*
3.01.01.03.02		*. . . . . Pit*	*$18,852*	*$2,460*	*$13,213*	*62.00%*	*$34,525*
001		*. . . . . Pit Walls*	*$14,039*	*$1,832*	*$9,840*	*62.00%*	*$25,712*
002		*. . . . . Excavation*	*$4,813*	*$628*	*$3,373*	*62.00%*	*$8,814*
3.01.03		**. . . . . Mission Support**	**$5,525,225**	**$721,042**	**$1,024,882**	**16.41%**	**$7,271,149**
3.01.03.01		. . . . . Hot Cell and Reactor Operation Readiness	$5,525,225	$721,042	$1,024,882	16.41%	$7,271,149
3.01.03.01		*. . . . . Operational Readiness*	*$5,525,225*	*$721,042*	*$1,024,882*	*16.41%*	*$7,271,149*
3.01.03.01.01	**OPC**	*. . . . . Facility Operations Cost*	*$848,000*	*$110,664*	*$163,530*	*17.06%*	*$1,122,194*
3.01.03.01.02	**OPC**	*. . . . . Establish Conduct of Operations*	*$1,107,000*	*$144,464*	*$204,295*	*16.32%*	*$1,455,759*
3.01.03.01.03	**OPC**	*. . . . . Personnel Training & Qualifications*	*$1,186,000*	*$154,773*	*$229,552*	*17.12%*	*$1,570,325*
3.01.03.01.04	**OPC**	*. . . . . Operating Instructions*	*$1,427,650*	*$186,308*	*$272,918*	*16.91%*	*$1,886,877*
3.01.03.01.05	**OPC**	*. . . . . Maintenance Instructions*	*$100,000*	*$13,050*	*$18,099*	*16.01%*	*$131,149*
3.01.03.01.06	**OPC**	*. . . . . Technical Safety Requirements Implementation*	*$415,200*	*$54,184*	*$76,865*	*16.38%*	*$546,249*
3.01.03.01.07	**OPC**	*. . . . . Equipment Grooming for Operational Readiness*	*$50,000*	*$6,525*	*$8,945*	*15.82%*	*$65,470*

BEA

Project Summary Report

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Level	Group	Description	Estimate Subtotal	Escalation	Management Reserve MR	MR %	TOTAL
3.01.03.01.08	**OPC**	*. . . . . Equipment Testing for ORR*	*$22,800*	*$2,975*	*$4,186*	*16.24%*	*$29,961*
3.01.03.01.09	**OPC**	*. . . . . Contractor Operational Readiness Review (ORR)*	*$223,600*	*$29,180*	*$41,808*	*16.54%*	*$294,588*
3.01.03.01.10	**OPC**	*. . . . . DOE Operational Readiness Review (ORR)*	*$24,600*	*$3,210*	*$4,683*	*16.84%*	*$32,494*
3.01.02.06		*. . . . . Apply Material G&A*	*$120,375*	*$15,709*	*$0*	*0.00%*	*$136,084*
		. . . . Long Term ACRR Operations	**$231,874,068**	**$287,136,445**	**$6,547,451**	**1.26%**	**$525,557,964**
3.02.01		**. . . . . Long Term Operations**	**$226,901,568**	**$271,578,487**	**$6,547,451**	**1.31%**	**$505,027,506**
3.02.01.01	**OPC**	. . . . . ACRR Long Term Operation Support	$212,000,000	$253,742,800	$0	0.00%	$465,742,800
3.02.01.02		. . . . . Scientific Coordinator	$14,901,568	$17,835,687	$6,547,451	20.00%	$39,284,706
3.03	**OPC**	**. . . . . D&D**	**$4,972,500**	**$15,557,958**	**$0**	**0.00%**	**$20,530,458**
		. . . . Science Program	**$23,973,583**	**$3,128,553**	**$2,910,068**	**10.74%**	**$30,012,204**
3.01.01.04		**. . . . . Fuel Motion Monitoring Equipment and Install**	**$20,728,287**	**$2,705,041**	**$2,343,333**	**10.00%**	**$25,776,662**
3.01.01.04.01		. . . . . Capital Line Item Project 413 Documentation Requirments	$3,258,654	$425,254	$368,391	10.00%	$4,052,300
3.01.01.04.02		. . . . . Detectors	$5,618,000	$733,149	$635,115	10.00%	$6,986,264
3.01.01.04.03		. . . . . Electronics	$2,530,538	$330,235	$286,077	10.00%	$3,146,851
3.01.01.04.04		. . . . . Coded Aperture Imaging Sytem	$848,000	$110,664	$95,866	10.00%	$1,054,530
3.01.01.04.05		. . . . . Install Coded Apeture Imaging System	$7,200,000	$939,600	$813,960	10.00%	$8,953,560
3.01.01.04.06		. . . . . Apply Material G&A	$1,273,095	$166,139	$143,923	10.00%	$1,583,157
3.01.04.01		**. . . . . Cross Cutting Baseline Transient Testing Capabilities**	**$3,245,296**	**$423,511**	**$566,735**	**15.45%**	**$4,235,542**
3.01.04.01.01	**OPC**	. . . . . Test Design	$1,382,600	$180,429	$145,580	9.31%	$1,708,609
001	**OPC**	*. . . . . Experiment Safety Analysis*	*$1,077,600*	*$140,627*	*$90,268*	*7.41%*	*$1,308,494*
002	**OPC**	*. . . . . Guide for Irradiation Experiments*	*$305,000*	*$39,803*	*$55,312*	*16.04%*	*$400,115*
3.01.04.01.02		. . . . . Scientific Coordinator	$1,862,696	$243,082	$421,156	20.00%	$2,526,933

Project Summary Report

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Level	Group	Description	Estimate Subtotal	Escalation	Management Reserve MR	MR %	TOTAL
Total	**RTT**	**Program - ACRR**	**$390,299,275**	**$307,041,025**	**$35,841,990**	**5.14%**	**$733,182,290**

Estimate Markup Report

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

CONTRACTOR	MARK-UP PERCENT	LABOR & EQUIP HOURS	LABOR	MATERIAL	EQUIPMENT	OTHERS	SUBTOTAL	% MARKUP	% DIRECT COST	% TOTAL COST
Battelle Energy Alliance - BEA										
DIRECT COST			$40,773,255	$223,240,658	$0	$0	$264,013,913			
	0.00%		$0	$0	$0	$0	$0	0.00%		
TOTAL FOR Battelle Energy Alliance - BEA		115,340	*$40,773,255*	*$223,240,658*	*$0*	*$0*	*$264,013,913*		67.64%	36.01%
Prime Contractor - PRIME										
DIRECT COST			$82,356,515	$43,924,035	$0	$4,813	$126,285,362			
	0.00%		$0	$0	$0	$0	$0	0.00%		
TOTAL FOR Prime Contractor - PRIME		124	*$82,356,515*	*$43,924,035*	*$0*	*$4,813*	*$126,285,362*		32.36%	17.22%
Direct Cost Subtotal		**115,464**	**$123,129,770**	**$267,164,693**	**$0**	**$4,813**	**$390,299,275**		**100.00%**	
Mark-Up Totals			**$0**	**$0**	**$0**	**$0**	**$0**			0.00%
Subtotal			**$123,129,770**	**$267,164,693**	**$0**	**$4,813**	**$390,299,275**			
Escalation	**78.67%**		**$46,098,604**	**$260,941,792**	**$0**	**$628**	**$307,041,025**			**41.88%**
Project Cost Subtotals			**$169,228,374**	**$313,263,297**	**$628**	**$5,441**	**$697,340,300**			
Management Reserve	**5.14%**		**$21,936,241**	**$13,902,376**	**$0**	**$3,373**	**$35,841,990**			**4.89%**
Total Cost w/ Markups			**$191,164,615**	**$327,165,673**	**$628**	**$8,814**	**$733,182,290**			

RTT Program - ACRR

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BEA

Report Settings Contractor Distribution Report

RTT Program - ACRR

NOTES:

1.) All features of SUCCESS are functional with this report.
2.) If Level Markups are used they should always be at the lowest level of the PWS Branch
3.) Detail line items should only be placed at the lowest level of a PWS Branch
4.) If a Level is collapsed then the detail will not be grouped nor reported. Completely expand the PWS to produce an accurate report
5.) If a level is distributed the amount will be added to the prime contractor amount
6.) Markup records must be percents and applied to all cost components
7.) The Other1,2,3 cost components are combined in the "Others" column.
8.) Reports are accurate to two decimal places (Productivity up to three decimal places).
9.) Multiple Prime Contractors may be used. The "Prime Contractor" totals will include all prime contractors' work, and the Prime Contractor Markups will be the aggregate markup of all prime contractors.
10.) Up to 10 contractor markups per contractor may be used. and must be percentages (not amounts).

Labor Resource Report

Activity: RTT Program - ACRR
Group:
Level:
Project Name: ACRR Transient Testing Operations & Intergration

Project Location: Sandia
Estimate Number: 1C40-K

Code	Description	WDC Year	Rate $/Hr	Hours	Direct Labor Cost
ADM	INL Admin, Doc. control		$65.00	**80**	$5,200
CNCARPC	CARPENTERS - CONCRETE	FY-12-13	$47.86	**53**	$2,527
CNCEM	CEMENT MASONS	FY-12-13	$45.94	**53**	$2,443
CNIRON	IRONWORKERS	FY-12-13	$57.47	**18**	$1,034
CRITSA/ENG	INL Criticality Safety Officer/Engineering		$205.00	**400**	$82,000
DE/ENG	INL Design Engineer		$195.00	**1,600**	$312,000
E14C2	NUCLEAR/REACTOR ENGINEERING	FY-13-D	$211.67	**79,200**	$16,764,264
IT/TEC	INL IT Technician		$105.00	**1,600**	$168,000
NU/ENG	INL Analyst Engineer/Nuc/Rx		$205.00	**5,520**	$1,131,600
OPER	INL Operator		$105.00	**80**	$8,400
OPR/ENG	INL Operations Engineer		$180.00	**200**	$36,000
OPR/MGR	INL Operations Manager		$205.00	**6,840**	$1,402,200
PLANNER	INL Planner		$120.00	**200**	$24,000
PM/PE	INL Project manager/Project engineer		$205.00	**760**	$155,800
RE/OPR	INL Reactor Operator		$120.00	**12,520**	$1,502,400
REA/SUP	INL Reactor Supervisor		$180.00	**800**	$144,000
SYSENG	INL Systems Engineer		$180.00	**640**	$115,200
TECH/EDIT	INL Tech Editor		$90.00	**2,600**	$234,000
TECH/WRT	TECHNICAL WRITER		$200.00	**500**	$100,000
TRN	INL Trainer		$120.00	**1,800**	$216,000
Total Labor Cost				**115,464**	**$22,407,069**

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
CR.10.16.01 Actuals From FY11 to FY13 and Projected work in 2013												
Memo:	***This reflects actuals and projections from 2011- 2013, excluding NEPA and Facility Condition Assesment Plans.***											
	BEA	*U.C. per LS*					*5899691*	*0*	*0*	*0*	*0*	*5899691*
	Program Actuals to date for the Refurbishments		1.00	LS	0		$5,899,691	$0	$0	$0	$0	$5,899,691
Memo:	This cost represents FY11 to FY13 actual costs plus baseline, excluding the EA and facility evaluation plan portion of the estimate.											
	Subtotal						$5,899,691	$0	$0	$0	$0	$5,899,691
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$5,899,691**
	Escalation						$0	$0	$0	$0	$0	$0
	Management Reserve						$0	$0	$0	$0	$0	$0
---Total	**CR.10.16.01 Actuals From FY11 to FY13 and Projected work in 2013**				**0**		**$5,899,691**	**$0**	**$0**	**$0**	**$0**	**$5,899,691**
3.01.01.01 Capital Line Item Project 413 Documentation Requirments												
	PRIME	*U.C. per Allow*					*150612372*	*0*	*0*	*0*	*0*	*150612372*
	15% of Construction Cost		0.15	Allow	0		$22,591,856	$0	$0	$0	$0	$22,591,856
	Subtotal						$22,591,856	$0	$0	$0	$0	$22,591,856
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$22,591,856**
	Escalation						$2,948,237	$0	$0	$0	$0	$2,948,237
	Management Reserve						$0	$0	$0	$0	$0	$0
---Total	**3.01.01.01 Capital Line Item Project 413 Documentation Requirments**				**0**		**$25,540,093**	**$0**	**$0**	**$0**	**$0**	**$25,540,093**
3.01.01.02.01 Hot Cell												
	PRIME	*U.C. per SF*		MAT14			*0*	*0*	*38351*	*0*	*0*	*38351*
	Construct New Hotcell $/sf		1,000.00	SF	0		$0	$0	$38,351,000	$0	$0	$38,351,000
Memo:	Based on average of 3 ATR HotCell Estimates escalated to 2012 dollars. 7A70 , Medium and Small ATR Hot Cell Estimates from ANNA (Burns and Row). Includes Design Through closeout.											

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.01.02.01 Hot Cell												
	PRIME	*U.C. per Ls*					*24000000*	*0*	*0*	*0*	*0*	*24000000*
	Hot Cell Infrastructure Support		1.00	Ls	0		$24,000,000	$0	$0	$0	$0	$24,000,000
	Memo: Based on the construction cost of the IMCL nuclear structure.											
	Subtotal						$24,000,000	$0	$38,351,000	$0	$0	$62,351,000
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$62,351,000**
	Escalation						$3,132,000	$0	$5,004,806	$0	$0	$8,136,806
	Management Reserve						$5,426,400	$0	$8,671,161	$0	$0	$14,097,561
---Total	**3.01.01.02.01 Hot Cell**				**0**		**$32,558,400**	**$0**	**$52,026,967**	**$0**	**$0**	**$84,585,367**
3.01.01.02.02 Internal Support Equipment												
**	PRIME	*U.C. per Allow*		MAT12			*0*	*0*	*3750000*	*0*	*0*	*3750000*
	In Cell Equipment		1.00	Allow	0		$0	$0	$3,750,000	$0	$0	$3,750,000
	Memo: Based on information provided by G. Teske											
	Subtotal						$0	$0	$3,750,000	$0	$0	$3,750,000
	Sales Tax						$0	$0	$225,000	$0	$0	$225,000
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$3,975,000**
	Escalation						$0	$0	$518,738	$0	$0	$518,738
	Management Reserve						$0	$0	$2,786,117	$0	$0	$2,786,117
---Total	**3.01.01.02.02 Internal Support Equipment**				**0**		**$0**	**$0**	**$7,279,855**	**$0**	**$0**	**$7,279,855**
External Equipment Support Systems												
	PRIME	*U.C. per Ls*					*7500000*	*0*	*0*	*0*	*0*	*7500000*
	Storage Pool & Ancillary		1.00	Ls	0		$7,500,000	$0	$0	$0	$0	$7,500,000
	Memo: Based of the ATR hot cell pool extension.											

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
External Equipment Support Systems												
		PRIME U.C. per Ls					*5000000*	*0*	*0*	*0*	*0*	*5000000*
	Overhead Cranes		1.00	Ls	0		$5,000,000	$0	$0	$0	$0	$5,000,000
Memo: 40 ton crane refurbishment cost are based on the program team.												
		PRIME U.C. per Ls					*15000000*	*0*	*0*	*0*	*0*	*15000000*
	Install Ancillary Systems		1.00	Ls	0		$15,000,000	$0	$0	$0	$0	$15,000,000
Memo: Costs to construct and install ancillary systems are based on the judgement of the program team.												
		PRIME U.C. per Ls					*5000000*	*0*	*0*	*0*	*0*	*5000000*
	Test and Startup		1.00	Ls	0		$5,000,000	$0	$0	$0	$0	$5,000,000
Memo: Based on the judgment of the program team.												
	Subtotal						$32,500,000	$0	$0	$0	$0	$32,500,000
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$32,500,000**
	Escalation						$4,241,250	$0	$0	$0	$0	$4,241,250
	Management Reserve						$7,348,250	$0	$0	$0	$0	$7,348,250
---Total	**External Equipment Support Systems**				**0**		**$44,089,500**	**$0**	**$0**	**$0**	**$0**	**$44,089,500**
3.01.01.02.03 Par Manipulator												
		PRIME U.C. per EA		MAT13			*0*	*0*	*1500000*	*0*	*0*	*1500000*
	PaR Manipulator Installed		1.00	EA	0		$0	$0	$1,500,000	$0	$0	$1,500,000
Memo: Based on Preliminary Quote												

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.01.02.03 Par Manipulator												
	Subtotal						$0	$0	$1,500,000	$0	$0	$1,500,000
	Sales Tax						$0	$0	$90,000	$0	$0	$90,000
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$1,590,000**
	Escalation						$0	$0	$207,495	$0	$0	$207,495
	Management Reserve						$0	$0	$1,114,447	$0	$0	$1,114,447
---Total	**3.01.01.02.03 Par Manipulator**				**0**		**$0**	**$0**	**$2,911,942**	**$0**	**$0**	**$2,911,942**
001 Plt Walls												
		PRIME	*U.C. per SF*		*0.132*	*$47.86*	*6.318*	*0*	*1.6*	*0*	*0*	*7.918*
	Formwork - Walls			400.00 SF	53	CNCARPC	$2,527	$0	$640	$0	$0	$3,167
		PRIME	*U.C. per tons*		*12*	*$57.47*	*689.64*	*0*	*1200*	*0*	*0*	*1889.64*
	Rebar			1.50 tons	18	CNIRON	$1,034	$0	$1,800	$0	$0	$2,834
	Memo: Assume 100lbs per cy											
		PRIME	*U.C. per cy*		*1.066*	*$45.94*	*48.972*	*0*	*170*	*0*	*0*	*218.972*
	Place Concrete			30.00 cy	32	CNCEM	$1,469	$0	$5,100	$0	$0	$6,569
	Memo: Assume average wall thickness is 4'.											
		PRIME	*U.C. per SF*		*0.053*	*$45.94*	*2.435*	*0*	*0.1*	*0*	*0*	*2.535*
	Break Ties, Patch Voids & Rub			400.00 SF	21	CNCEM	$974	$0	$40	$0	$0	$1,014
	Subtotal						$6,005	$0	$7,580	$0	$0	$13,585
	Sales Tax						$0	$0	$455	$0	$0	$455
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$14,039**
	Escalation						$784	$0	$1,049	$0	$0	$1,832
	Management Reserve						$4,209	$0	$5,632	$0	$0	$9,840
---Total	**001 Plt Walls**				**124**		**$10,997**	**$0**	**$14,715**	**$0**	**$0**	**$25,712**

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DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
002 Excavation												
Memo:	***based on 25' depth and 10' x 10' base using 1/1 slope***											
	PRIME	*U.C. per CY*					*0*	*0*	*0*	*2.25*	*0*	*2.25*
	Excavation for Pit		1,250.00	CY	0		$0	$0	$0	$2,813	$0	$2,813
Memo:	Rate based on RS Means pg 1029 and factored for work at DOE facility											
	PRIME	*U.C. per CY*					*0*	*0*	*0*	*1.6*	*0*	*1.6*
	Backfill Pit		1,250.00	CY	0		$0	$0	$0	$2,000	$0	$2,000
Memo:	Rate based on RS Means pg 1034 and factored for work at DOE facility											
	Subtotal						$0	$0	$0	$4,813	$0	$4,813
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$4,813**
	Escalation						$0	$0	$0	$628	$0	$628
	Management Reserve						$0	$0	$0	$3,373	$0	$3,373
---Total	**002 Excavation**				**0**		**$0**	**$0**	**$0**	**$8,814**	**$0**	**$8,814**
3.01.03.01.01 Facility Operations Cost												
	BEA	*U.C. per LS*	NM60				*0*	*0*	*800000*	*0*	*0*	*800000*
	Setup Cost for non-labor materials, equipment and supplies		1.00	LS	0		$0	$0	$800,000	$0	$0	$800,000
Memo:	$200,000 a year for 4 years											
	Subtotal						$0	$0	$800,000	$0	$0	$800,000
	Sales Tax						$0	$0	$48,000	$0	$0	$48,000
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$848,000**
	Escalation						$0	$0	$110,664	$0	$0	$110,664
	Management Reserve						$0	$0	$163,530	$0	$0	$163,530
---Total	**3.01.03.01.01 Facility Operations Cost**				**0**		**$0**	**$0**	**$1,122,194**	**$0**	**$0**	**$1,122,194**

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.03.01.02 Establish Conduct of Operations													
		BEA	*U.C. per EA*			*1800*	*$205.00*	*369000*	*0*	*0*	*0*	*0*	*369000*
	INL Operations Manager, full time			2.00	EA	3,600	OPR/MGR	$738,000	$0	$0	$0	$0	$738,000
OPR/MGR		BEA	*U.C. per EA*			*900*	*$205.00*	*184500*	*0*	*0*	*0*	*0*	*184500*
	Assistant Operations Manager, full time			2.00	EA	1,800	OPR/MGR	$369,000	$0	$0	$0	$0	$369,000
	Subtotal							$1,107,000	$0	$0	$0	$0	$1,107,000
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$1,107,000**
	Escalation							$144,464	$0	$0	$0	$0	$144,464
	Management Reserve							$204,295	$0	$0	$0	$0	$204,295
	Total 3.01.03.01.02 Establish Conduct of Operations					**5,400**		**$1,455,759**	**$0**	**$0**	**$0**	**$0**	**$1,455,759**

3.01.03.01.03 Personnel Training & Qualifications

Memo: ***Training was reduced from the original AREVA estimate, assume the remainder of the training will be performed in FY-16. This funding will be provided by the facility operations under different funding.***

		BEA	*U.C. per EA*			*1800*	*$120.00*	*216000*	*0*	*0*	*0*	*0*	*216000*
	INL Trainer			1.00	EA	1,800	TRN	$216,000	$0	$0	$0	$0	$216,000
		BEA	*U.C. per EA*			*400*	*$180.00*	*72000*	*0*	*0*	*0*	*0*	*72000*
	INL Reactor Supervisor			2.00	EA	800	REA/SUP	$144,000	$0	$0	$0	$0	$144,000
		BEA	*U.C. per EA*			*400*	*$180.00*	*72000*	*0*	*0*	*0*	*0*	*72000*
	INL Experiment Coordinator			1.00	EA	400	SYSENG	$72,000	$0	$0	$0	$0	$72,000
		BEA	*U.C. per EA*			*400*	*$195.00*	*78000*	*0*	*0*	*0*	*0*	*78000*
	INL Design Engineer, 2- Electrical, 2- Mechanical			4.00	EA	1,600	DE/ENG	$312,000	$0	$0	$0	$0	$312,000
		BEA	*U.C. per EA*			*400*	*$120.00*	*48000*	*0*	*0*	*0*	*0*	*48000*
	INL Reactor Operator			4.00	EA	1,600	RE/OPR	$192,000	$0	$0	$0	$0	$192,000
		BEA	*U.C. per EA*			*400*	*$105.00*	*42000*	*0*	*0*	*0*	*0*	*42000*
	INL Analyst Engineer/Nuc/Rx			4.00	EA	1,600	IT/TEC	$168,000	$0	$0	$0	$0	$168,000

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.03.01.03 Personnel Training & Qualifications												
Memo:	***Training was reduced from the original AREVA estimate, assume the remainder of the training will be performed in FY-16. This funding will be provided by the facility operations under different funding.***											
	BEA	*U.C. per EA*			*400*	*$205.00*	*82000*	*0*	*0*	*0*	*0*	*82000*
	INL Criticality Safety Officer/Engineering		1.00	EA	400	CRITSA/EN	$82,000	$0	$0	$0	$0	$82,000
	Subtotal						$1,186,000	$0	$0	$0	$0	$1,186,000
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$1,186,000**
	Escalation						$154,773	$0	$0	$0	$0	$154,773
	Management Reserve						$229,552	$0	$0	$0	$0	$229,552
---Total	**3.01.03.01.03 Personnel Training & Qualifications**				**8,200**		**$1,570,325**	**$0**	**$0**	**$0**	**$0**	**$1,570,325**
3.01.03.01.04 Operating Instructions												
	BEA	*U.C. per Doc*			*20*	*$120.00*	*2400*	*0*	*0*	*0*	*0*	*2400*
	Labor Cost for rewriting of documents (1500 Pg)		250.00	Doc	5,000	RE/OPR	$600,000	$0	$0	$0	$0	$600,000
	BEA	*U.C. per Doc*			*10*	*$90.00*	*900*	*0*	*0*	*0*	*0*	*900*
	Rewrite Doc, Tech Editor		250.00	Doc	2,500	TECH/EDIT	$225,000	$0	$0	$0	$0	$225,000
	BEA	*U.C. per Doc*			*20*	*$120.00*	*2400*	*0*	*0*	*0*	*0*	*2400*
	Rewrite Doc, Reactor Operator		250.00	Doc	5,000	RE/OPR	$600,000	$0	$0	$0	$0	$600,000

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.03.01.04 Operating Instructions													
	BEA	*U.C. per Doc*		NM60				*0*	*0*	*10*	*0*	*0*	*10*
	Printing Allowance			250.00	Doc	0		$0	$0	$2,500	$0	$0	$2,500
	Subtotal							$1,425,000	$0	$2,500	$0	$0	$1,427,500
	Sales Tax							$0	$0	$150	$0	$0	$150
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$1,427,650**
	Escalation							$185,963	$0	$346	$0	$0	$186,308
	Management Reserve							$272,412	$0	$507	$0	$0	$272,918
---Total 3.01.03.01.04 Operating Instructions						**12,500**		**$1,883,374**	**$0**	**$3,502**	**$0**	**$0**	**$1,886,877**
3.01.03.01.05 Maintenance Instructions													
	BEA	*U.C. per LS*				*500*	*$200.00*	*100000*	*0*	*0*	*0*	*0*	*100000*
	Allowance for rewrite at $500 per page1			1.00	LS	500	TECH/WRT	$100,000	$0	$0	$0	$0	$100,000
	Subtotal							$100,000	$0	$0	$0	$0	$100,000
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$100,000**
	Escalation							$13,050	$0	$0	$0	$0	$13,050
	Management Reserve							$18,099	$0	$0	$0	$0	$18,099
---Total 3.01.03.01.05 Maintenance Instructions						**500**		**$131,149**	**$0**	**$0**	**$0**	**$0**	$131,149
3.01.03.01.06 Technical Safety Requirements Implementation													
	BEA	*U.C. per EA*				*1000*	*$205.00*	*205000*	*0*	*0*	*0*	*0*	*205000*
	Implementation of TSR			1.00	EA	1,000	NU/ENG	$205,000	$0	$0	$0	$0	$205,000
	BEA	*U.C. per EA*				*1000*	*$205.00*	*205000*	*0*	*0*	*0*	*0*	*205000*
	INL SORC Chair			1.00	EA	1,000	OPR/MGR	$205,000	$0	$0	$0	$0	$205,000

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.03.01.06 Technical Safety Requirements Implementation												
	BEA	*U.C. per EA*			*80*	*$65.00*	*5200*	*0*	*0*	*0*	*0*	*5200*
	INL Admin, Doc Control		1.00	EA	80	ADM	$5,200	$0	$0	$0	$0	$5,200
	Subtotal						$415,200	$0	$0	$0	$0	$415,200
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$415,200**
	Escalation						$54,184	$0	$0	$0	$0	$54,184
	Management Reserve						$76,865	$0	$0	$0	$0	$76,865
---Total	**3.01.03.01.06 Technical Safety Requirements Implementation**				**2,080**		**$546,249**	**$0**	**$0**	**$0**	**$0**	**$546,249**
3.01.03.01.07 Equipment Grooming for Operational Readiness												
	BEA	*U.C. per LS*					*50000*	*0*	*0*	*0*	*0*	*50000*
	Allowance for operational readiness review		1.00	LS	0		$50,000	$0	$0	$0	$0	$50,000
	Subtotal						$50,000	$0	$0	$0	$0	$50,000
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$50,000**
	Escalation						$6,525	$0	$0	$0	$0	$6,525
	Management Reserve						$8,945	$0	$0	$0	$0	$8,945
---Total	**3.01.03.01.07 Equipment Grooming for Operational Readiness**				**0**		**$65,470**	**$0**	**$0**	**$0**	**$0**	**$65,470**
3.01.03.01.08 Equipment Testing for ORR												
	BEA	*U.C. per LS*			*120*	*$120.00*	*14400*	*0*	*0*	*0*	*0*	*14400*
	Equipment testing, Reactor Operator		1.00	LS	120	RE/OPR	$14,400	$0	$0	$0	$0	$14,400

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DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.03.01.08 Equipment Testing for ORR												
	BEA	*U.C. per LS*			*80*	*$105.00*	*8400*	*0*	*0*	*0*	*0*	*8400*
	Equipment testing		1.00	LS	80	OPER	$8,400	$0	$0	$0	$0	$8,400
	Subtotal						$22,800	$0	$0	$0	$0	$22,800
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$22,800**
	Escalation						$2,975	$0	$0	$0	$0	$2,975
	Management Reserve						$4,186	$0	$0	$0	$0	$4,186
---Total	**3.01.03.01.08 Equipment Testing for ORR**				**200**		**$29,961**	**$0**	**$0**	**$0**	**$0**	**$29,961**
3.01.03.01.09 Contractor Operational Readiness Review (ORR)												
	BEA	*U.C. per LS*			*240*	*$205.00*	*49200*	*0*	*0*	*0*	*0*	*49200*
	Internal BEA management review, Operations Manager		1.00	LS	240	OPR/MGR	$49,200	$0	$0	$0	$0	$49,200
	BEA	*U.C. per LS*			*240*	*$180.00*	*43200*	*0*	*0*	*0*	*0*	*43200*
	Internal BEA management review, Systems Engineer		1.00	LS	240	SYSENG	$43,200	$0	$0	$0	$0	$43,200
	BEA	*U.C. per LS*			*240*	*$205.00*	*49200*	*0*	*0*	*0*	*0*	*49200*
	Interviews by ORR team of personnel involved in TREAT Restart		1.00	LS	240	PM/PE	$49,200	$0	$0	$0	$0	$49,200

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.03.01.09 Contractor Operational Readiness Review (ORR)												
	BEA	*U.C. per LS*			*400*	*$205.00*	*82000*	*0*	*0*	*0*	*0*	*82000*
	TREAT ORR documentation preparation		1.00	LS	400	PM/PE	$82,000	$0	$0	$0	$0	$82,000
	Subtotal						$223,600	$0	$0	$0	$0	$223,600
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$223,600**
	Escalation						$29,180	$0	$0	$0	$0	$29,180
	Management Reserve						$41,808	$0	$0	$0	$0	$41,808
---Total	**3.01.03.01.09 Contractor Operational Readiness Review (ORR)**				**1,120**		**$294,588**	**$0**	**$0**	**$0**	**$0**	**$294,588**
3.01.03.01.10 DOE Operational Readiness Review (ORR)												
	BEA	*U.C. per LS*			*120*	*$205.00*	*24600*	*0*	*0*	*0*	*0*	*24600*
	BEA Support for ORR DOE		1.00	LS	120	PM/PE	$24,600	$0	$0	$0	$0	$24,600
	Subtotal						$24,600	$0	$0	$0	$0	$24,600
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$24,600**
	Escalation						$3,210	$0	$0	$0	$0	$3,210
	Management Reserve						$4,683	$0	$0	$0	$0	$4,683
---Total	**3.01.03.01.10 DOE Operational Readiness Review (ORR)**				**120**		**$32,494**	**$0**	**$0**	**$0**	**$0**	**$32,494**
3.01.02.06 Apply Material G&A												
	BEA	*U.C. per mat$*	NT20				*0*	*0*	*0.15*	*0*	*0*	*0.15*
	Material G&A during Execution		802,500.00	mat$	0		$0	$0	$120,375	$0	$0	$120,375

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Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.02.06 Apply Material G&A												
	Subtotal						$0	$0	$120,375	$0	$0	$120,375
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$120,375**
	Escalation						$0	$0	$15,709	$0	$0	$15,709
	Management Reserve						$0	$0	$0	$0	$0	$0
---Total	**3.01.02.06 Apply Material G&A**				**0**		**$0**	**$0**	**$136,084**	**$0**	**$0**	**$136,084**
3.02.01.01 ACRR Long Term Operation Support												
	Memo:	***This is based on running 5 months a year. This is based on running 10 experiments a year.***										
	BEA	*U.C. per MO*		MAT08			*0*	*0*	*1000000*	*0*	*0*	*1000000*
	ACRR Operations Cost Monthly		200.00	MO	0		$0	$0	$200,000,000	$0	$0	$200,000,000
	Memo: Includes 2 months in 2018 and 3 months each in 2019 through 2027. This implies a 12 million dollar annual budget for ACRR maintenance, operations, and experiment infrastructure.											
	Subtotal						$0	$0	$**,***,***	$0	$0	$200,000,000
	Sales Tax						$0	$0	$12,000,000	$0	$0	$12,000,000
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$212,000,000**
	Escalation						$0	$0	$**,***,***	$0	$0	$253,742,800
	Management Reserve						$0	$0	$0	$0	$0	$0
---Total	**3.02.01.01 ACRR Long Term Operation Support**				**0**		**$0**	**$0**	**$**,***,*** **	**$0**	**$0**	**$465,742,800**
3.02.01.02 Scientific Coordinator												
E14C2	BEA	*U.C. per FTE*			*70400*	*$211.67*	*14901568*	*0*	*0*	*0*	*0*	*14901568*
	NUCLEAR/REACTOR ENGINEERING		1.00	FTE	70,400	E14C2	$14,901,568	$0	$0	$0	$0	$14,901,568
	Memo: This allowance is for one full time FTE to support TREAT Restart activities.											

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.02.01.02 Scientific Coordinator												
	Subtotal						$14,901,568	$0	$0	$0	$0	$14,901,568
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$14,901,568**
	Escalation						$17,835,687	$0	$0	$0	$0	$17,835,687
	Management Reserve						$6,547,451	$0	$0	$0	$0	$6,547,451
---Total	**3.02.01.02 Scientific Coordinator**				**70,400**		**$39,284,706**	**$0**	**$0**	**$0**	**$0**	**$39,284,706**
3.03 D&D												
	Memo:		***Reactor D&D cost are based on actuals provided by other subcontractors currently doing this type of work. The size of the buildings to be D&D, are based of the square footage of the TREAT facility. Escalation has been factored in these dollares to represent FY 2013.***									
		BEA	*U.C. per Sqft*				*221*	*0*	*0*	*0*	*0*	*221*
	Reactor Building Demolition		22,500.00	Sqft	0		$4,972,500	$0	$0	$0	$0	$4,972,500
	Subtotal						$4,972,500	$0	$0	$0	$0	$4,972,500
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$4,972,500**
	Escalation						$15,557,958	$0	$0	$0	$0	$15,557,958
	Management Reserve						$0	$0	$0	$0	$0	$0
---Total	**3.03 D&D**				**0**		**$20,530,458**	**$0**	**$0**	**$0**	**$0**	**$20,530,458**
3.01.01.04.01 Capital Line Item Project 413 Documentation Requirments												
		PRIME	*U.C. per Allow*				*21724362*	*0*	*0*	*0*	*0*	*21724362*
	15% of Construction Cost		0.15	Allow	0		$3,258,654	$0	$0	$0	$0	$3,258,654

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DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.01.04.01 Capital Line Item Project 413 Documentation Requirments												
	Subtotal						$3,258,654	$0	$0	$0	$0	$3,258,654
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$3,258,654**
	Escalation						$425,254	$0	$0	$0	$0	$425,254
	Management Reserve						$368,391	$0	$0	$0	$0	$368,391
---Total	**3.01.01.04.01 Capital Line Item Project 413 Documentation Requirments**				**0**		**$4,052,300**	**$0**	**$0**	**$0**	**$0**	**$4,052,300**
3.01.01.04.02 Detectors												
		BEA	*U.C. per Ea*	NM60			*0*	*0*	*5000*	*0*	*0*	*5000*
	Proportional			380.00 Ea	0		$0	$0	$1,900,000	$0	$0	$1,900,000
		BEA	*U.C. per Ea*	NM60			*0*	*0*	*5000*	*0*	*0*	*5000*
	N Scintillators			380.00 Ea	0		$0	$0	$1,900,000	$0	$0	$1,900,000
		BEA	*U.C. per Ea*	NM60			*0*	*0*	*5000*	*0*	*0*	*5000*
	Nal Gamma			150.00 Ea	0		$0	$0	$750,000	$0	$0	$750,000
		BEA	*U.C. per Ea*	NM60			*0*	*0*	*10000*	*0*	*0*	*10000*
	Fission Chambers			75.00 Ea	0		$0	$0	$750,000	$0	$0	$750,000
	Subtotal						$0	$0	$5,300,000	$0	$0	$5,300,000
	Sales Tax						$0	$0	$318,000	$0	$0	$318,000
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$5,618,000**
	Escalation						$0	$0	$733,149	$0	$0	$733,149
	Management Reserve						$0	$0	$635,115	$0	$0	$635,115
---Total	**3.01.01.04.02 Detectors**				**0**		**$0**	**$0**	**$6,986,264**	**$0**	**$0**	**$6,986,264**

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.01.04.03 Electronics													
		BEA	*U.C. per Ea*		NM60			*0*	*0*	*100*	*0*	*0*	*100*
	Cable			1,773.00	Ea	0		$0	$0	$177,300	$0	$0	$177,300
		BEA	*U.C. per Ea*		NM60			*0*	*0*	*20000*	*0*	*0*	*20000*
	Data Acquisition			65.00	Ea	0		$0	$0	$1,300,000	$0	$0	$1,300,000
		BEA	*U.C. per Ea*		NM60			*0*	*0*	*10000*	*0*	*0*	*10000*
	HV Supplies			65.00	Ea	0		$0	$0	$650,000	$0	$0	$650,000
		BEA	*U.C. per Ea*		NM60			*0*	*0*	*10000*	*0*	*0*	*10000*
	Chassis			26.00	Ea	0		$0	$0	$260,000	$0	$0	$260,000
	Subtotal							$0	$0	$2,387,300	$0	$0	$2,387,300
	Sales Tax							$0	$0	$143,238	$0	$0	$143,238
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$2,530,538**
	Escalation							$0	$0	$330,235	$0	$0	$330,235
	Management Reserve							$0	$0	$286,077	$0	$0	$286,077
Total 3.01.01.04.03 Electronics						**0**		**$0**	**$0**	**$3,146,851**	**$0**	**$0**	**$3,146,851**
3.01.01.04.04 Coded Aperture Imaging Sytem													
		BEA	*U.C. per Ea*		NM60			*0*	*0*	*500000*	*0*	*0*	*500000*
	Collimator			1.00	Ea	0		$0	$0	$500,000	$0	$0	$500,000
		BEA	*U.C. per Ea*		NM60			*0*	*0*	*150000*	*0*	*0*	*150000*
	X-Y Locator			1.00	Ea	0		$0	$0	$150,000	$0	$0	$150,000

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.01.04.04 Coded Aperture Imaging Sytem													
		BEA	*U.C. per Ea*		NM60			*0*	*0*	*150000*	*0*	*0*	*150000*
	N-Source Cal Sys			1.00	Ea	0		$0	$0	$150,000	$0	$0	$150,000
	Subtotal							$0	$0	$800,000	$0	$0	$800,000
	Sales Tax							$0	$0	$48,000	$0	$0	$48,000
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$848,000**
	Escalation							$0	$0	$110,664	$0	$0	$110,664
	Management Reserve							$0	$0	$95,866	$0	$0	$95,866
---Total 3.01.01.04.04 Coded Aperture Imaging Sytem						**0**		**$0**	**$0**	**$1,054,530**	**$0**	**$0**	**$1,054,530**
3.01.01.04.05 Install Coded Apeture Imaging System													
		BEA	*U.C. per FTE*					*450000*	*0*	*0*	*0*	*0*	*450000*
	Hodoscope Install			6.00	FTE	0		$2,700,000	$0	$0	$0	$0	$2,700,000
		BEA	*U.C. per FTE*					*450000*	*0*	*0*	*0*	*0*	*450000*
	DSA Install			3.00	FTE	0		$1,350,000	$0	$0	$0	$0	$1,350,000
		BEA	*U.C. per FTE*					*450000*	*0*	*0*	*0*	*0*	*450000*
	Design			3.00	FTE	0		$1,350,000	$0	$0	$0	$0	$1,350,000

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.01.04.05 Install Coded Apeture Imaging System												
	BEA	*U.C. per FTE*					*450000*	*0*	*0*	*0*	*0*	*450000*
	DAQ		4.00	FTE	0		$1,800,000	$0	$0	$0	$0	$1,800,000
	Subtotal						$7,200,000	$0	$0	$0	$0	$7,200,000
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$7,200,000**
	Escalation						$939,600	$0	$0	$0	$0	$939,600
	Management Reserve						$813,960	$0	$0	$0	$0	$813,960
---Total	**3.01.01.04.05 Install Coded Apeture Imaging System**				**0**		**$8,953,560**	**$0**	**$0**	**$0**	**$0**	**$8,953,560**
3.01.01.04.06 Apply Material G&A												
	BEA	*U.C. per mat$*		NT20			*0*	*0*	*0.15*	*0*	*0*	*0.15*
	Material G&A during Execution		8,487,300.00	mat$	0		$0	$0	$1,273,095	$0	$0	$1,273,095
	Subtotal						$0	$0	$1,273,095	$0	$0	$1,273,095
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$1,273,095**
	Escalation						$0	$0	$166,139	$0	$0	$166,139
	Management Reserve						$0	$0	$143,923	$0	$0	$143,923
---Total	**3.01.01.04.06 Apply Material G&A**				**0**		**$0**	**$0**	**$1,583,157**	**$0**	**$0**	**$1,583,157**
001 Experiment Safety Analysis												
	BEA	*U.C. per EA*			*320*	*$205.00*	*65600*	*0*	*0*	*0*	*0*	*65600*
	Write experimental safety analysis document		1.00	EA	320	NU/ENG	$65,600	$0	$0	$0	$0	$65,600
	BEA	*U.C. per EA*			*120*	*$205.00*	*24600*	*0*	*0*	*0*	*0*	*24600*
	Review and approve experiment safety analysis document		1.00	EA	120	NU/ENG	$24,600	$0	$0	$0	$0	$24,600

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number:***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
001 Experiment Safety Analysis													
	BEA	*U.C. per EA*				*960*	*$205.00*	*196800*	*0*	*0*	*0*	*0*	*196800*
	Develop neutronics model of TREAT core			1.00	EA	960	NU/ENG	$196,800	$0	$0	$0	$0	$196,800
	BEA	*U.C. per EA*				*200*	*$205.00*	*41000*	*0*	*0*	*0*	*0*	*41000*
	Review and approve nuetronics model			1.00	EA	200	NU/ENG	$41,000	$0	$0	$0	$0	$41,000
	BEA	*U.C. per EA*				*960*	*$205.00*	*196800*	*0*	*0*	*0*	*0*	*196800*
	Develop transient thermal hydraulic model of test			1.00	EA	960	NU/ENG	$196,800	$0	$0	$0	$0	$196,800
	BEA	*U.C. per EA*				*200*	*$205.00*	*41000*	*0*	*0*	*0*	*0*	*41000*
	Review and approve thermal hydraulic model			1.00	EA	200	NU/ENG	$41,000	$0	$0	$0	$0	$41,000
	BEA	*U.C. per EA*				*960*	*$205.00*	*196800*	*0*	*0*	*0*	*0*	*196800*
	Develop validated fuel pin energy deposition model			1.00	EA	960	NU/ENG	$196,800	$0	$0	$0	$0	$196,800
	BEA	*U.C. per EA*				*200*	*$205.00*	*41000*	*0*	*0*	*0*	*0*	*41000*
	Review and approve fuel pin energy deposition model			1.00	EA	200	NU/ENG	$41,000	$0	$0	$0	$0	$41,000
	BEA	*U.C. per LS*				*200*	*$120.00*	*24000*	*0*	*0*	*0*	*0*	*24000*
	INL Planner			1.00	LS	200	PLANNER	$24,000	$0	$0	$0	$0	$24,000
	BEA	*U.C. per EA*						*250000*	*0*	*0*	*0*	*0*	*250000*
	Allowance to test and refurbish test loops			1.00	EA	0		$250,000	$0	$0	$0	$0	$250,000
	Subtotal							$1,077,600	$0	$0	$0	$0	$1,077,600
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$1,077,600**
	Escalation							$140,627	$0	$0	$0	$0	$140,627
	Management Reserve							$90,268	$0	$0	$0	$0	$90,268
—Total	**001 Experiment Safety Analysis**					**4,120**		**$1,308,494**	**$0**	**$0**	**$0**	**$0**	**$1,308,494**

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor		Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
002 Guide for Irradiation Experiments													
		BEA	*U.C. per LS*			*600*	*$205.00*	*123000*	*0*	*0*	*0*	*0*	*123000*
	INL Analyst Engineer/Nuc/Rx develop guide and incorporate comments			1.00	LS	600	NU/ENG	$123,000	$0	$0	$0	$0	$123,000
		BEA	*U.C. per LS*			*200*	*$205.00*	*41000*	*0*	*0*	*0*	*0*	*41000*
	INL Operations Manager review			1.00	LS	200	OPR/MGR	$41,000	$0	$0	$0	$0	$41,000
		BEA	*U.C. per LS*			*200*	*$180.00*	*36000*	*0*	*0*	*0*	*0*	*36000*
	Operations Engineer review			1.00	LS	200	OPR/ENG	$36,000	$0	$0	$0	$0	$36,000
		BEA	*U.C. per LS*			*800*	*$120.00*	*96000*	*0*	*0*	*0*	*0*	*96000*
	INL Reactor Operator			1.00	LS	800	RE/OPR	$96,000	$0	$0	$0	$0	$96,000
		BEA	*U.C. per LS*			*100*	*$90.00*	*9000*	*0*	*0*	*0*	*0*	*9000*
	Tech editor			1.00	LS	100	TECH/EDIT	$9,000	$0	$0	$0	$0	$9,000
	Subtotal							$305,000	$0	$0	$0	$0	$305,000
	Sales Tax							$0	$0	$0	$0	$0	$0
	Markups		0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate												**$305,000**
	Escalation							$39,803	$0	$0	$0	$0	$39,803
	Management Reserve							$55,312	$0	$0	$0	$0	$55,312
---Total	**002 Guide for Irradiation Experiments**					**1,900**		**$400,115**	**$0**	**$0**	**$0**	**$0**	**$400,115**
3.01.04.01.02 Scientific Coordinator													
E14C2		BEA	*U.C. per FTE*			*8800*	*$211.67*	*1862696*	*0*	*0*	*0*	*0*	*1862696*
	NUCLEAR/REACTOR ENGINEERING			1.00	FTE	8,800	E14C2	$1,862,696	$0	$0	$0	$0	$1,862,696
	Memo: This allowance is for one full time FTE to support TREAT Restart activities.												

DETAIL ITEM REPORT

Project Name: ***ACRR Transient Testing Operations & Intergration***

Project Location: ***Sandia***
Estimate Number: ***1C40-K***

Client: ***L. O. Nelson***
Prepared By: ***A. W. Miller***
Estimate Type: ***Preliminary Class 5***

Code	Description	Contractor	Qty	UOM	Hrs	Resource	Labor	Equipment	Material	Subcontractor	Other	TOTAL
3.01.04.01.02	**Scientific Coordinator**											
	Subtotal						$1,862,696	$0	$0	$0	$0	$1,862,696
	Sales Tax						$0	$0	$0	$0	$0	$0
	Markups	0.00%					$0	$0	$0	$0	$0	$0
	Subtotal Estimate											**$1,862,696**
	Escalation						$243,082	$0	$0	$0	$0	$243,082
	Management Reserve						$421,156	$0	$0	$0	$0	$421,156
---Total	**3.01.04.01.02 Scientific Coordinator**			8,800			**$2,526,933**	**$0**	**$0**	**$0**	**$0**	**$2,526,933**
	Subtotal RTT Program - ACRR						**$**,***,*** **	**$0**	**$**,***,*** **	**$4,813**	**$0**	**$377,426,432**
	Sales Tax						**$0**	**$0**	**$12,872,843**	**$0**	**$0**	**$12,872,843**
	Markups						**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
	Subtotal Estimate											**$390,299,275**
	Escalation						**$46,098,604**	**$0**	**$**,***,*** **	**$628**	**$0**	**$307,041,025**
	Management Reserve						**$21,936,241**	**$0**	**$13,902,376**	**$3,373**	**$0**	**$35,841,990**
	Total RTT Program - ACRR			**115,464**			**$191,164,615**	**$0**	**$542,008,861**	**$8,814**	**$0**	**$733,182,290**

Appendix D
Total TREAT Fuel Energy Release

As indicated in the letter embedded on the next page of this appendix, the total energy deposited into TREAT fuel as of November 1997 is 2,600,581 MJ. No additional energy has been deposited into TREAT fuel since that time. The total allowable energy deposited into TREAT fuel is 6,997,000 MJ. As a result, transient testing at TREAT from 1959 to 1997 used approximately:

2,600,581/6,997,000 * 100% = 37%

of the total allowable deposited energy. This means that approximately

100% -37% = 63%

is available for future transient testing.

ARGONNE NATIONAL LABORATORY

INTRA-LABORATORY MEMO

RWS-1998-80

November 24, 1998

TO: L. C. Walters — Engineering Division Director

FROM: R. W. Swanson — Facility Operations Department Manager

SUBJECT: **Total TREAT Energy Release**

TREAT Technical Specification 5.2.4 requires that I report to the Division Director at least annually the total energy deposited in the TREAT core since the startup of TREAT. This total must be compared to the value of 6,997,000 MJ which is used in the current FSAR to evaluate the radiological hazard associated with a beyond DBA.

The current total is 2,600,581 MJ, which is the same as reported during November 1997.

RWS:lg

copies: M. L. Conley
D. M. Ray
File 1.2.2
RF, SF

Appendix E
Risk Event Management Reserve, DOE-Held Contingency, and Cost Savings Opportunities

Development of the risk event management reserve, contingency for the two alternatives, and cost savings opportunities is described in this appendix. During the RTTP, many types of risks and opportunities for cost savings will be encountered. For TREAT, the risks and opportunities that are anticipated to have the highest cost impact are identified and are provided in this appendix. The probability of each risk being realized is qualitatively classified based on the best available information as likely, unlikely, or highly unlikely with a percentage assigned to each qualitative probability. The risk event management reserve and contingency is calculated as the product of the cost impact and the probability. The risk event management reserve and DOE-held contingency for TREAT refurbishment is the sum of the risks as shown in Table E-1 and Table E-2, respectively. The ACRR risk event management reserve and contingency are scaled from the TREAT management reserve and contingency based on the relative cost risk identified by the subject matter experts (see Criterion 31 in Table 2, Section 3.1) as shown in Table C-1 in Appendix C.

A preliminary evaluation was done to identify potential cost savings opportunities for the TREAT alternative. The cost savings opportunities for ACRR were calculated linearly from the TREAT cost savings opportunities. The cost savings opportunities for both alternatives are presented in Table E-3.

Table E-1. Risk event management reserve for TREAT and ACRR based on the major internal program risks identified in the TREAT program risk register.

Risk Number	Risk Description	Cost Impact	Probability		Upper Bound of Risk Event Management Reserve ($M)
			Likely = 50% Unlikely = 20% Highly Unlikely = 5%	%	
1	The condition assessment of TREAT fuel indicates that the fuel must be replaced. The lower bound is associated with replacement of ten fuel elements and the upper bound is associated with replacement of 50 fuel elements.	$1 to 5M	Unlikely	20%	$1.0M
2	The TREAT Reactor Trip System (RTS) will have to be replaced instead of refurbished	$3 to 5M	Unlikely	20%	$1.0M
3	A change in existing quality requirements for the TREAT Automatic Reactor Control System (ARCS) will require complete re-design of an off-the-shelf system	$3 to 5M	Unlikely	20%	$1.0M
4	Re-evaluation of TREAT SSC's during preparation of the 10 CFR 830-compliant DSA results in major changes to quality and reliability requirements that impacts the cost of multiple systems	$2 to 3M	Unlikely	20%	$0.6M
5	Extensive seismic upgrades are realized at TREAT	$2 to 3M	Highly Unlikely	5%	$0.15M
6	The TREAT Control Rod Drives must be replaced instead of re-furbished	$1 to 3M	Unlikely	20%	$0.6M
7	The cumulative impact of unexpected existing conditions encountered during conduct of assessment and refurbishment activities – tracked and maintained in an on-going program risk register	$5 to 10M	Likely	50%	$5.0M

Risk Number	Risk Description	Cost Impact	Probability		Upper Bound of Risk Event Management Reserve ($M)
			Likely = 50% Unlikely = 20% Highly Unlikely = 5%	%	
8	Uncertainties associated with successful completion of operational readiness activities	$5 to 10M	Likely	50%	$5.0M
Total TREAT Risk Event Management Reserve:					$14.4M
Total ACRR Risk Event Management Reserve:[1]					$40.8M

1. ACRR management reserve is calculated from the TREAT Management Reserve (MR) using the results of the qualitative analysis performed by the alternatives analysis subject matter experts. The relative cost risk for TREAT and ACRR was 0.85 and 0.76 respectively and the ratio of the ACRR and TREAT cost risks is 0.76/0.85 = 0.89. The upper bound of TREAT risk event MR is 25.7% of the TREAT RTTP cost (TREAT MR of $14.4M/ TREAT RTTP Cost of $56M * 100% = 25.7%). The upper bound of ACRR risk event MR is 25.7% * 0.89 = 22.9% of the ACRR RTTP. The calculated ACRR MR is 22.9% * $178M = $40.8M.

Table E-2. Risk event DOE-held contingency for TREAT and ACRR that is based on risks external to the resumption of transient testing program.

Risk Number	Risk Description	Cost Impact ($M)	Probability Likely = 50% Unlikely = 20% Highly Unlikely = 5%	%	Upper Bound of Risk Event DOE-held Contingency ($M)
1	Significant scope changes driven by changing interests/program needs	$2 to 5M	Unlikely	20	$1.0M
2	Delays in receipt of funding that result in schedule delays and ultimately increase escalation	$3 to 5M	Likely	50	$ 2.5M
3	Delays in receiving DOE approval for nuclear safety documentation	$2 to 3M	Unlikely	20	$0.6M
4	Project progress is curtailed by an injunction resulting from a challenge to the NEPA process	$2 to 3M	Likely	50	$1.5M
5	Changes to security access requirements	$1 to 2M	Unlikely	20	$0.4M
6	Unexpected force majeure event (other than a serious injury or death, e.g., union strikes, severe weather, natural disasters, or brush fires), that results in a work stoppage, then delays to the project could arise, impacting cost and schedule	$1 to 2M	Highly Unlikely	5	$0.1M
7	Changes to applicable nuclear safety requirements or the approved code of record are experienced after the program baseline is established that result in the need for additional design features or documentation	$1 to 2M	Unlikely	20	$0.4M
Upper Bound of risk event DOE-held contingency for TREAT:					$6.5M
Upper Bound of risk event DOE-held contingency for ACRR: [1]					$18.3M

1. ACRR DOE-held contingency is calculated from the TREAT DOE-held contingency using the results of the qualitative analysis performed by the alternatives analysis subject matter experts. The relative cost risk for TREAT and ACRR was 0.85 and 0.76 respectively and the ratio of the ACRR and TREAT cost risks is 0.76/0.85 = 0.89. The upper bound of the DOE-held contingency for TREAT is 11.6% of the TREAT RTTP cost estimate (DOE-Held contingency of $6.5M/TREAT cost estimate of $56M * 100% = 11.6%). The upper bound of the DOE-held contingency for ACRR is 11.6% * 0.89 = 10.3% of the sum of new construction and mission operations support for ACRR (10.3% * $178M = $18.3M).

Table E-3. Cost savings opportunities for the TREAT alternative.

#	Cost Savings Opportunity Description	Range of Cost Savings Opportunity ($M)
1	Instead of refurbishing/replacing the entire reactor control system, limit scope to refurbishment of control rod drives and replacement of the automatic reactor control system components that can no longer be maintained such as magnetic tape drives, hard drives, and control boards that no longer work	$2.0M to $6.0M
2	Limit replacement of reactor control room components to those that can no longer be maintained and refurbish the reactor control building so that it can be occupied – instead of relocating it to the original reactor control building.	$2.0M to $3.0M
3	Reduce the conservatism of the assumptions used to perform seismic/structural analysis of the 15-ton crane. It is anticipated that revised assumptions (that are still conservative) will indicate that the crane support structure does not require modification to meet PC-2 requirements.	$0.2M to $0.3M
4	Apply innovative staffing strategy for RTTP and subsequent operations such as multiple functions being performed by a single position	$2.0M to $3.0M
5	Integrate GTRI (LEU conversion program) modeling and analysis work to ensure that scope performed is not duplicated and is executed as efficiently as possible	$1.0M to $2.0M
6	Pursue alternatives for updating the DSA that eliminates the need for a BIO and minimizes DSA update costs (i.e., limit modifications of the existing SAR to correcting deficiencies)	$1.0M to $2.0M
7	Accomplish scope with resources from BEA partner companies (partner companies contribute intellectual property and labor, as appropriate)	$2.0M to $4.0M
8	Pending successful acceptance testing, use existing filtration/cooling system (HEPA system)	$0.5M to $1.0M
9	Implement modern communication technologies to allow use of existing fiber optic cables to support reactor operations, as needed – eliminating the need to dig a trench and replace cables between the TREAT Reactor Building and the TREAT Reactor Control Building	$0.5M to $1.5M
10	Evaluate need for standby power systems. As feasible, reduce replacement of UPS and/or diesel generator(s).	$0.2M to $0.5M
11	Continue to maintain the existing radiation monitoring equipment (RAMs and CAMs) as opposed to replacing them. Also, use hand friskers for building egress instead of procuring personnel contamination monitors (PCMs).	$0.2M to $1.1M
12	Eliminate installation of fire protection system into high bay through additional fire hazard analyses	$0.3M to $0.5M
Range of Cost Savings Opportunities for TREAT:		$11.9M to $24.9M
Range of Cost Savings Opportunities for ACRR[1]:		$37.9M to $79.2M

1. The range of ACRR cost savings is calculated from the TREAT cost savings as follows: The lower range TREAT cost savings of $11.9M is 21.3% of the RTTP point estimate ($11.9M/$56M = 21.3%), the upper range TREAT cost savings of $24.9M is 44.5% of the RTTP point estimate ($24.9M/$56 = 44.5%), the ACRR lower range is 21.3% of the ACRR point estimate (21.3% * $178M = $37.9M, the ACRR upper range is 44.5% of the ACRR point estimate (44.5% * $178M = $79.2M).

Appendix F
Detailed Scoring Results

Each alternative was assigned a score for each of the criteria by the subject matter experts. The scoring is shown in the following pages of this appendix.

			Results									
			DOE		Nuclear Fuel Developer		Reactor Operator		Congressional Staff		Environmental Interest Group	
	Criteria	Scoring Explanation	TREAT	ACRR	TREAT	ACRR	TREAT	ACRR	TREAT	ACRR	TREAT	ACRR
1	Perform transient experiment C1A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.048	0.048	0.041	0.041	0.014	0.014	0.007	0.007	0.014	0.014
2	Perform transient experiment C1B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.024	0.024	0.021	0.021	0.014	0.014	0.007	0.007	0.014	0.014
3	Perform transient experiment L1A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.073	0.073	0.062	0.062	0.014	0.014	0.007	0.007	0.014	0.014
4	Perform transient experiment L1B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.017	0.016	0.014	0.013	0.003	0.003	0.005	0.005	0.010	0.009
5	Perform transient experiment L1C	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.048	0.048	0.041	0.041	0.014	0.014	0.007	0.007	0.014	0.014
6	Perform transient experiment C2A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.005	0.005	0.030	0.030	0.017	0.017	0.002	0.002	0.009	0.009
7	Perform transient experiment C2B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.005	0.005	0.009	0.009	0.017	0.017	0.002	0.002	0.009	0.009
8	Perform transient experiment C2C	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.005	0.005	0.009	0.009	0.017	0.017	0.002	0.002	0.009	0.009

9	Perform transient experiment L2A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.005	0.005	0.039	0.037	0.009	0.008	0.002	0.002	0.009	0.009
10	Perform transient experiment L2B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.005	0.005	0.039	0.037	0.009	0.008	0.002	0.002	0.009	0.009
11	Perform transient experiment L2C	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.005	0.005	0.020	0.019	0.014	0.013	0.002	0.002	0.009	0.009
12	Perform transient experiment L2D	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.005	0.005	0.009	0.009	0.017	0.016	0.002	0.002	0.009	0.009
13	Perform transient experiment L2E	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.005	0.005	0.030	0.028	0.014	0.013	0.002	0.002	0.009	0.009
14	Perform transient experiment C3A	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance	0.016	0.016	0.014	0.014	0.009	0.009	0.004	0.004	0.018	0.018
15	Perform transient experiment C3B	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance	0.016	0.016	0.014	0.014	0.009	0.009	0.004	0.004	0.018	0.018
16	Perform transient experiment C3C	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance	0.016	0.016	0.014	0.014	0.009	0.009	0.004	0.004	0.018	0.018
17	Perform transient experiment C3D	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance	0.016	0.016	0.000	0.000	0.009	0.009	0.004	0.004	0.018	0.018
18	Measure fission product release and reconstruct fission product release as a function of time	100% Full functionality - real-time 85% Re-creation of fission release throuh capture and post-analysis 67% Full functionality with low risk development and investment 33% Partial functionality 0% No functionality	0.065	0.065	0.061	0.061	0.014	0.014	0.071	0.071	0.036	0.036

19	Monitor and measure the temperature, pressure, coolant velocity, and chemistry throughout the transient	100% Full functionality 67% Full functionality with low risk development and investment 33% Partial functionality 0% No functionality	0.065	0.065	0.124	0.124	0.029	0.029	0.071	0.071	0.036	0.036
20	% of the year available for transient experiments	100% 12 months 90% 10 to 11 months 80% 8 to 9 months 50% 6 to 7 months 25% 4 to 5 months 15% 2 to 3 months 0% <2 months	0.042	0.037	0.044	0.039	0.009	0.008	0.048	0.043	0.021	0.019
21	Available time to set up experiments, including reactor outage	100% As long as required 67% 4 to 6 weeks 33% 2 to 3 weeks 0% <2 weeks	0.031	0.031	0.049	0.049	0.015	0.015	0.053	0.053	0.024	0.024
22	% reactor available to perform experiments (e.g., number of available slots)	100% Full dedicated to experiment in progress 67% Other experiments compete for reaction conditions, but they can schedule them in 1 to 2 years 50% Requires coordination of three years or more to get on schedule 33% High competition exists for desired slots in reactor (significant cooridnation required) 0% Reactor priorities and schedules effectively eliminate transient experimentation support (already fully burdened)	0.031	0.031	0.049	0.049	0.010	0.010	0.053	0.053	0.024	0.024
23	Cost and number of years to create capability (i.e., initial investment needed to provide the transient testing capability)	Linear relationship from $0 to $120 Million investment required	0.029	0.018	0.025	0.015	0.060	0.036	0.029	0.018	0.019	0.012
24	Cost to conduct LWR, LMR, and HTGR experiments	Linear relationship from $0 to $400 Million cost of life cycle operations (does not include the investment cost)	0.001	0.004	0.000	0.003	0.001	0.008	0.001	0.004	0.000	0.003
25	Impact to environmental discriminators	100% No impact due to facilities are currently operating and require no upgrades or design basis changes 85% Negligible impact due to use of existing facilities but requires upgrading equipment without change to safety basis 67% Low to medium impact due to use of existing facility with required upgrades and extension of current safety basis to conducte transient testing experiments 50% Medium impact due to requiring new high radiological facility to perform transient experiments 40% Medium impact but new radiological facility attached to another new facility already planned (adding sq ft rather than completely new) 33% Medium to high impact due to requiring more than one radiological facility to conduct transient testing experiments 0% Very high impact due to requiring a new nuclear reactor to conduct transient experiments	0.019	0.011	0.004	0.002	0.030	0.018	0.032	0.019	0.079	0.047
26	Impact to safety and health of public	100% Negligible or very low impact to safety and health of public due to conducting or transporting material in the performance of transient testing experiments 95% Some small number of capsules potentially shipped off site although majority of experiments conducted without transporting on public roads 67% Low to medium impact to safety and health of public from transporting nuclear materials across public roads (1x per experiment) 33% Medium to high impact to safety and health of public resulting from 2x transports per experiment across public roads in conducting transient testing experiments 0% Very high impact to safety and health of public requiring 3x per experiment for transfers of nuclear materials on public roads to conduct transient testing experiments	0.029	0.009	0.006	0.002	0.068	0.022	0.047	0.016	0.118	0.039
27	Impact to safety and health of workers	100% Negligible or low impact to safety and health of workers (no dose or increase in radiological workers) as a result of conducting irradiated fuel transient testing experiments 67% Low to medium impact to safety and health fo workers (current workforce obtaining higher dose from additional handling in performance of irradiated fuel transient testing experiments) 40% Marginal improvement over medium to high impact by using existing workers for some early or excess experimental capacity (reduces numbers of new rad workers) 33% Medium to high impact to safety and health of workers due to increase in radiological workers and increase dose from handling due to performance of irradiated fuel transient testing experiments 0% Very high impact to safety and health of workers due to workers and handling where radiological infrastructure is not sufficiently in place to conduct irradiated fuel transient testing experiments	0.009	0.009	0.002	0.002	0.015	0.015	0.016	0.016	0.039	0.039

28	Security, transportation and control outside secure areas	100% Negligible or low impact to security, transportation and control measures outside of the transient testing capability area (no outside control area shipping) 67% Low to medium impact to security, trnasportation and contorl measures outside of the transient testing capability area (single shipment on public road to control per experiment) 33% Medium to high impact to security, transportation and control measures outside of the transient testing capability area (two shipments to control per experiment) 0% Very high impact to security, transportation and control measures outside of the transient testing capability area (more than two shipments/experiment to control)	0.043	0.014	0.009	0.003	0.043	0.014	0.036	0.012	0.036	0.012
29	Security, transportation and control within transient testing capability areas	100%- Negligible or low impact to security, transportation and control measures within the transient testing capability area 67%- Low to medium impact to security, transportation and control measures within the transient testing capability area 33%- Medium to high impact to security, transportation and control measures within the transient testing capability area 0%- Very high impact to security, transportation and control measures within the transient testing capability area	0.043	0.043	0.009	0.009	0.021	0.021	0.036	0.036	0.036	0.036
30	Technical performance risk	100%-No risk to performing transient experimentation 90% - Low risk to completing needed tests on time, some risk to beginning early to collect baseline data 70%- Low to medium risk to performing transient experimenation, begins early but cannot complete without new hot cell not yet planned 50%- Medium to high risk to performing transient experimenation, begins early but cannot complete without new transporter not yet defined 25%- High to very high risk to performing transient experimenation 0%- Very high or higher to performing transient experimenation	0.026	0.020	0.038	0.029	0.040	0.031	0.028	0.022	0.016	0.013
31	Cost risk	Linear conversion of the contingency costs due to cost estimate uncertainties (range of $ to $75M)	0.003	0.005	0.001	0.002	0.003	0.005	0.005	0.008	0.003	0.004
32	Schedule risk to perform experiments	100%- Able to meet needs to required experiments with ability to have excess capacity for international needs (<9 capacity/yr) and can complete ATF schedule by 2022 end date 85%- Could perform ATF and LMR loop test needs (up to 9/yr) and can complete ATF schedule by 2022 end date 67% - Could perform >6 loop tests per year supporting ATF experiment needs and can complete ATF schedule by 2022 end date 50% - Can support ATF with some throughput (6 loop tests per year) and does not delay ATF completion by no more than 2 years 33%- Can support ATF with some throughput (4-5 loop tests per year) and does not delay ATF completion by no more than 4 years 15% Can support ATF with some throughput (3 loop tests or few / year) and delays ATF completion by more than 4 years 0%- Can not meet the experimental needs of the ATF program	0.010	0.003	0.025	0.008	0.045	0.015	0.031	0.010	0.018	0.006
33	Schedule risk to resume transient testing	Summary of capsule and loop startup 50%-capsule transient capability by 2015 and 50% for loop transient capability by 2017 (MNS could begin using by date) 45% capsule transient capability by 2017 and 45% for loop transient capability by 2019 (derived MNS must date for loop testing) 35% - capsule transient capability by 2018 and 35% for loop transient capability by 2020 25%-capsule transient capability by 2019 and 25% for loop transient capability by 2021 15%-capsule transient capability by 2020 and 15% for loop transient capability by 2022 5%-capsule transient capability by 2021 and 5% for loop transient capability by 2023 0%-capsule transient capabilityafter 2021 and 0% for loop transient capability after 2023	0.023	0.014	0.013	0.008	0.036	0.022	0.025	0.016	0.014	0.009
34	Impact on other facility missions or users	100%- Negligible or no impact to other facility missions or users 95% - Some improvement over low risk due to mutiple facility availability for some experiments to deconflict with other programs 90% - Low risk due to requiring only localized single site coordination to perform experiment 75%- Low to medium impact due to one other facility (multiple sites) to coordinate with 50%- Medium impact due to requiring two coordinations (multiple sites) / experiment for same facility 25% High impact due to more than two coordination facilities (multiple sites) / experiment 0%- Very high impact to other facility missions or users	0.059	0.033	0.017	0.009	0.103	0.057	0.161	0.089	0.064	0.036
		Overall Score	**0.848**	**0.732**	**0.883**	**0.814**	**0.749**	**0.545**	**0.811**	**0.623**	**0.795**	**0.601**

Appendix G
Unweighted Utility Scores

To complete the scoring process for the viable alternatives, each alternative was assigned a score of zero to one by the subject matter experts for each criterion. The scoring assigned to each criterion is provided in the following pages in this appendix. The scores were multiplied by the criteria weights (see Appendix A) and then summed to generate a combined score for each alternative (see Appendix F). The combined scores for the two viable alternatives for each weight are the basis for selecting the preferred alternative (see Figure 2 in the main body of this report). The TREAT alternative scored higher than the ACRR alternative for each of the stakeholder weight sets considered.

	Criteria	Scoring Explanation	Alternatives 1 Restart of TREAT	2 ACRR/ New Hot Cell/ New Hodoscope
1	Perform transient experiment C1A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	1
2	Perform transient experiment C1B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	1
3	Perform transient experiment L1A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	1
4	Perform transient experiment L1B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	0.7	0.65
5	Perform transient experiment L1C	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	1
6	Perform transient experiment C2A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	1
7	Perform transient experiment C2B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	1
8	Perform transient experiment C2C	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	1

9	Perform transient experiment L2A	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	0.95
10	Perform transient experiment L2B	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	0.95
11	Perform transient experiment L2C	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	0.95
12	Perform transient experiment L2D	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	0.95
13	Perform transient experiment L2E	100%-Full functionality and full/highest performance 90% Full Functionality, Full Performance where reactor height is not a variable that matters but energy level is enough but less 85% Full functionality, full performance but smaller reactor height if fuel is significantly longer 67% Full functionality and partial performance 33% Partial Functionality and partial performance 0% No functionality or performance	1	0.95
14	Perform transient experiment C3A	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance	1	1
15	Perform transient experiment C3B	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance	1	1
16	Perform transient experiment C3C	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance	1	1
17	Perform transient experiment C3D	Performance based on 10 ms to 10 sec transient tests 100% Fully perform full range 67% Full functionality, partial performance 33% Partial functionality, partial performance 0% No functionality, no performance	1	1
18	Measure fission product release and reconstruct fission product release as a function of time	100% Full functionality - real-time 85% Re-creation of fission release throuh capture and post-analysis 67% Full functionality with low risk development and investment 33% Partial functionality 0% No functionality	1	1

19	Monitor and measure the temperature, pressure, coolant velocity, and chemistry throughout the transient	100% Full functionality 67% Full functionality with low risk development and investment 33% Partial functionality 0% No functionality	1	1
20	% of the year available for transient experiments	100% 12 months 90% 10 to 11 months 80% 8 to 9 months 50% 6 to 7 months 25% 4 to 5 months 15% 2 to 3 months 0% <2 months	0.9	0.8
21	Available time to set up experiments, including reactor outage	100% As long as required 67% 4 to 6 weeks 33% 2 to 3 weeks 0% <2 weeks	1	1
22	% reactor available to perform experiments (e.g., number of available slots)	100% Full dedicated to experiment in progress 67% Other experiments compete for reaction conditions, but they can schedule them in 1 to 2 years 50% Requires coordination of three years or more to get on schedule 33% High competition exists for desired slots in reactor (significant cooridnation required) 0% Reactor priorities and schedules effectively eliminate transient experimentation support (already fully burdened)	1	1
23	Cost and number of years to create capability (i.e., initial investment needed to provide the transient testing capability)	Linear relationship from $0 to $120 Million investment required	0.541667	0.329167
24	Cost to conduct LWR, LMR, and HTGR experiments	Linear relationship from $0 to $400 Million cost of life cycle operations (does not include the investment cost)	0.01	0.07
25	Impact to environmental discriminators	100% No impact due to facilities are currently operating and require no upgrades or design basis changes 85% Negligible impact due to use of existing facilities but requires upgrading equipment without change to safety basis 67% Low to medium impact due to use of existing facility with required upgrades and extension of current safety basis to conducte transient testing experiments 50% Medium impact due to requiring new high radiological facility to perform transient experiments 40% Medium impact but new radiological facility attached to another new facility already planned (adding sq ft rather than completely new) 33% Medium to high impact due to requiring more than one radiological facility to conduct transient testing experiments 0% Very high impact due to requiring a new nuclear reactor to conduct transient experiments	0.67	0.4
26	Impact to safety and health of public	100% Negligible or very low impact to safety and health of public due to conducting or transporting material in the performance of transient testing experiments 95% Some small number of capsules potentially shipped off site although majority of experiments conducted without transporting on public roads 67% Low to medium impact to safety and health of public from transporting nuclear materials across public roads (1x per experiment) 33% Medium to high impact to safety and health of public resulting from 2x transports per experiment across public roads in conducting transient testing experiments 0% Very high impact to safety and health of public requiring 3x per experiment for transfers of nuclear materials on public roads to conduct transient testing experiments	1	0.33
27	Impact to safety and health of workers	100% Negligible or low impact to safety and health of workers (no dose or increase in radiological workers) as a result of conducting irradiated fuel transient testing experiments 67% Low to medium impact to safety and health fo workers (current workforce obtaining higher dose from additional handling in performance of irradiated fuel transient testing experiments) 40% Marginal improvement over medium to high impact by using existing workers for some early or excess experimental capacity (reduces numbers of new rad workers) 33% Medium to high impact to safety and health of workers due to increase in radiological workers and increase dose from handling due to performance of irradiated fuel transient testing experiments 0% Very high impact to safety and health of workers due to workers and handling where radiological infrastructure is not sufficiently in place to conduct irradiated fuel transient testing experiments	0.33	0.33

28	Security, transportation and control outside secure areas	100% Negligible or low impact to security, transportation and control measures outside of the transient testing capability area (no outside control area shipping) 67% Low to medium impact to security, trnasportation and contorl measures outside of the transient testing capability area (single shipment on public road to control per experiment) 33% Medium to high impact to security, transportation and control measures outside of the transient testing capability area (two shipments to control per experiment) 0% Very high impact to security, transportation and control measures outside of the transient testing capability area (more than two shipments/experiment to control)	1	0.33
29	Security, transportation and control within transient testing capability areas	100%- Negligible or low impact to security, transportation and control measures within the transient testing capability area 67%- Low to medium impact to security, transportation and control measures within the transient testing capability area 33%- Medium to high impact to security, transportation and control measures within the transient testing capability area 0%- Very high impact to security, transportation and control measures within the transient testing capability area	1	1
30	Technical performance risk	100%-No risk to performing transient experimentation 90% - Low risk to completing needed tests on time, some risk to beginning early to collect baseline data 70%- Low to medium risk to performing transient experimenation, begins early but cannot complete without new hot cell not yet planned 50%- Medium to high risk to performing transient experimenation, begins early but cannot complete without new transporter not yet defined 25%- High to very high risk to performing transient experimenation 0%- Very high or higher to performing transient experimenation	0.9	0.7
31	Cost risk	Linear conversion of the contingency costs due to cost estimate uncertainties (range of $ to $75M)	0.15	0.24
32	Schedule risk to perform experiments	100%- Able to meet needs to required experiments with ability to have excess capacity for international needs (<9 capacity/yr) and can complete ATF schedule by 2022 end date 85%- Could perform ATF and LMR loop test needs (up to 9/yr) and can complete ATF schedule by 2022 end date 67% - Could perform >6 loop tests per year supporting ATF experiment needs and can complete ATF schedule by 2022 end date 50% - Can support ATF with some throughput (6 loop tests per year) and does not delay ATF completion by no more than 2 years 33%- Can support ATF with some throughput (4-5 loop tests per year) and does not delay ATF completion by no more than 4 years 15% Can support ATF with some throughput (3 loop tests or few / year) and delays ATF completion by more than 4 years 0%- Can not meet the experimental needs of the ATF program	1	0.33
33	Schedule risk to resume transient testing	Summary of capsule and loop startup 50%-capsule transient capability by 2015 and 50% for loop transient capability by 2017 (MNS could begin using by date) 45% capsule transient capability by 2017 and 45% for loop transient capability by 2019 (derived MNS must date for loop testing) 35% - capsule transient capability by 2018 and 35% for loop transient capability by 2020 25%-capsule transient capability by 2019 and 25% for loop transient capability by 2021 15%-capsule transient capability by 2020 and 15% for loop transient capability by 2022 5%-capsule transient capability by 2021 and 5% for loop transient capability by 2023 0%-capsule transient capabilityafter 2021 and 0% for loop transient capability after 2023	0.8	0.5
34	Impact on other facility missions or users	100%- Negligible or no impact to other facility missions or users 95% - Some improvement over low risk due to mutiple facility availability for some experiments to deconflict with other programs 90% - Low risk due to requiring only localized single site coordination to perform experiment 75%- Low to medium impact due to one other facility (multiple sites) to coordinate with 50%- Medium impact due to requiring two coordinations (multiple sites) / experiment for same facility 25% High impact due to more than two coordination facilities (multiple sites) / experiment 0%- Very high impact to other facility missions or users	0.9	0.5

Appendix H
Sensitivity Analysis Results Summary

To complete the sensitivity analysis, the stakeholder weights were varied from 0 to 1 to evaluate the impact of changing weights on the combined score for the analysis. The attached figure shows that if minimizing the cost to operate the transient test reactor is the only important factor, the ACRR alternative is the most favorable. For all other weight sets, the TREAT alternative is the most favorable.