



# Consulting on HTGR Design and Analysis Methods - Lommers

July 2016

*Changing the World's Energy Future*

Michelle T Sharp, Hans D. Gougar



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**July 2016**

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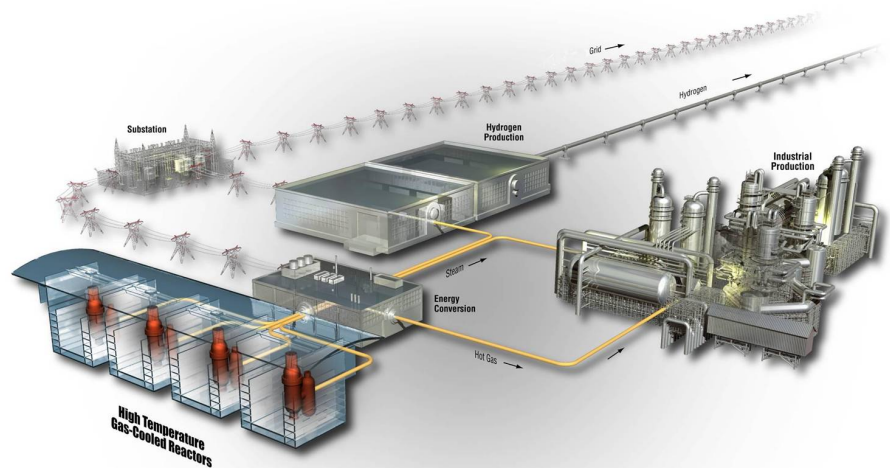
**<http://www.inl.gov>**

**Prepared for the  
U.S. Department of Energy  
Under DOE Idaho Operations Office  
Contract Unknown**

## Statement of Work

Project No. 24890

# Consulting on HTGR Design and Analysis Methods - Lommers



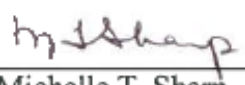


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## Idaho National Laboratory

<b>CONSULTING ON HTGR DESIGN AND ANALYSIS METHODS - LOMMERS</b>	Identifier:	SOW-9068
	Revision:	4
	Effective Date:	07/12/2016
INL ART Program		Statement of Work (SOW)

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SIGNATURES			
Signature and Typed or Printed Name	Signature Code	Date (mm/dd/yyyy)	Organization/Discipline
 Hans D. Gougar	P	7/12/16	INL ART TDO Deputy Technical Director
 Diane V. Croson	A	7/12/16	INL ART TDO Deputy Director
 Michelle T. Sharp	C	7/12/16	H330/INL ART TDO Quality Assurance

**P** For Preparer of the document.**A** For Approval: This is for non-owner approvals that may be required as directed by a given program or project. This signature may not be applicable for all uses of this form.**C** For documented review and concurrence.**Note** Applicable QLD: ALL-000141

## REVISION LOG

[illegible]

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## 1. SCOPE

### 1.1 Introduction

The Advanced Reactor Technologies –Gas Cooled Reactor (ART-GCR) program has undertaken an effort to develop point designs of a gas-cooled, graphite moderated irradiation test reactor (TR) and a larger demonstration reactor (DR). The Department of Energy (DOE) is specifying requirements and performance metrics for these two systems. Both designs pose challenges, and their development will benefit from interaction with a potential vendor. The work defined in this subcontract supports the effort to generate point designs for gas-cooled test and demonstration reactors.

### 1.2 Work Included

AREVA (the Supplier) will perform the following tasks:

1. Advise ART-GCR personnel on general design attributes of a potential gas-cooled, graphite moderated irradiation test reactor.
2. Prepare a report evaluating the AREVA SC-high temperature gas reactor (HTGR) design against the demonstration reactor performance metrics. The report will also address economic scalability of the high temperature reactor; i.e. the sensitivity of the cost of the plant to the total thermal power output while retaining essential safety and performance features, in order to determine its suitability for different markets and applications.
3. Prepare a summary report of the HTGR demonstration reactor design.
4. Attend meetings and participate in webinars, as requested, to provide consulting support and technical input.
5. Provide input on codes, analyses, and experiments needed to license high temperature reactors.
6. Review and provide feedback on the Methods Technical Program plan.

### 1.3 Work Excluded

No experimental work will be performed in support of this statement of work.

## 2. APPLICABLE CODES, PROCEDURES, AND REFERENCES

1. Demonstration Reactor Goals and Metrics, Report from the April 23-24, 2015 Workshop at Argonne National Laboratory (still in Draft).



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2. Test Reactor Goals and Metrics, Report from the April 23-24, 2015 Workshop at Argonne National Laboratory (still in Draft).

### 3. TECHNICAL AND FUNCTIONAL REQUIREMENTS

None

### 4. ENVIRONMENTAL, SAFETY, HEALTH, AND QUALITY ASSURANCE REQUIREMENTS

#### 4.1 Environmental

Not applicable.

#### 4.2 Safety and Health

Not applicable.

#### 4.3 Quality Assurance/Control

NQA-1-2008/1a-2009, "Quality Assurance Requirements for Nuclear Facility Applications" as applicable.

### 5. RESPONSIBILITIES

The Supplier, as represented by Mr. Lewis Lommers, principal investigator, is responsible for the tasks in Section 1.2, and the resulting deliverables will be released as outlined in Section 6 "Deliverable Schedule."

Deliverables consist of electronic mails and letter reports that document the technical design and analysis work requested in Section 1.2. The deliverable schedule is defined in the next section.

The Contractor will provide the latest versions of the references listed in Section 2 at the start of the contract period. Specific criteria may be redacted, as they have not been finalized.

The Contractor will provide a technical report summarizing the preliminary core neutronic and thermal fluid performance of a small (~100MWt) test reactor by August 30, 2015.

The Supplier will provide written feedback and suggestions to the Contractor for further analysis on the small high temperature TR (Deliverable #1).

The Contractor will deliver updated results of the analyses to the Supplier in a draft Test Reactor Report by December 1, 2015.

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The Supplier provides feedback and recommendations on the draft TR report (Deliverable #2).

The Supplier will deliver a draft report to the Contractor on the evaluation of the AREVA Steam Cycle HTGR against the DR goals and metrics (Deliverable #3). The Supplier will deliver a final report to the Contractor on the evaluation of the AREVA Steam Cycle HTGR against the DR goals and metrics (Deliverable #4).

The Supplier will deliver a summary report to the Contractor on its HTGR demonstration reactor design (Deliverable #5).

## **6. DELIVERABLE SCHEDULE**

1. Deliverable #1 – 15 October 2015
2. Deliverable #2 – 15 January 2016
3. Deliverable #3 – 15 January 2016
4. Deliverable #4 – 30 January 2016
5. Deliverable #5 - 25 January 2016

## **7. SPECIAL CONDITIONS**

None

## **8. ACCEPTANCE**

NA

## **9. APPENDICES**

None

## **10. ATTACHMENTS**

None