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ATR PRA Presentation for MEXT visit - additional slides

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November 2018

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Risk-Informed Operation and the Risk Monitor

- The ATR PRA was used to create a list of risk-significant components using the built in importance measures of SAPHIRE
  - Risk Reduction Ratio – ΔCDF if the SSC never fails
  - Risk Increase Ratio – ΔCDF if the SSC always fails
  - Helps with procurement and commercial grade dedication
- Recently, this list was compared against the list of safety SSC's identified by the safety basis and the list of "critical" components identified by the Equipment Reliability Group to help determine equipment upgrade priorities
- Prior to October 2017, the Risk Monitor had only been used by the ATR PRA Engineers to follow maintenance work and equipment outages while the reactor was at power and to risk-inform ATR Operations, Engineering, and Planning prior to performing work at power.
- Today, the Risk Monitor is available in the reactor control room so Operations can enter changes in equipment status as they occur.

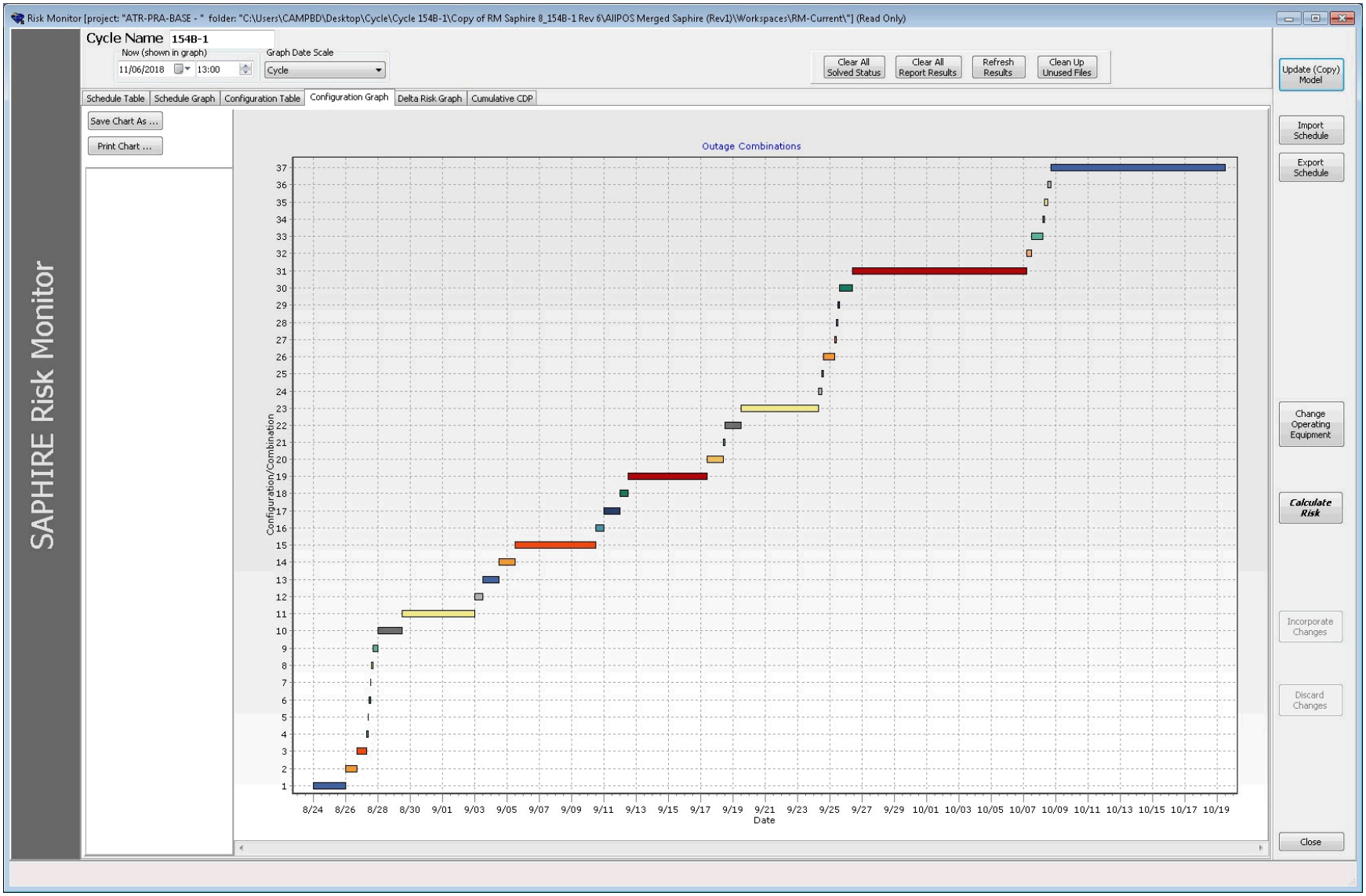
Application of PRA and Risk Monitor

- Assess increases (or decreases) in risk as plant status changes due to equipment failures or maintenance activities
  - Train Work Week Managers, Operations, and Engineering to use for evaluating work weeks, daily operations, and planning activities performed during operation and shutdown modes.
- Assistance in categorizing SSCs (e.g. safety class, safety related, important to safety, defense in depth)
- Voluntary entry into Technical Specification Requirements Limiting Condition for Operation Action Statements to perform online maintenance.
- Support changes to the licensing basis (SAR, TSRs) such as LCO completion times or equipment operability requirements
- In-service inspection and testing

Insights

- There are no dominant sequence groups indicating mitigation systems are appropriate
- Environmental aspects of important components need to be evaluated to credit their potential safety function (e.g., fire water spray on switchgear and other electrical systems)
- Operating procedures and training could be improved to emphasize the importance of vessel venting and proper operation of firewater injection
- Replacing open cable trays with solid bottom cable trays above some buses could provide an effective thermal barrier
- Buildings housing support equipment are seismically weak and should be upgraded or equipment moved
- Upgrade unqualified primary coolant piping (completed)
- Confinement release is dominated by load drop events and most large releases are due to stored fuel and not the fuel in the core

Risk Monitor graph showing each discrete configuration



Risk Monitor graph showing changes in equipment status over time