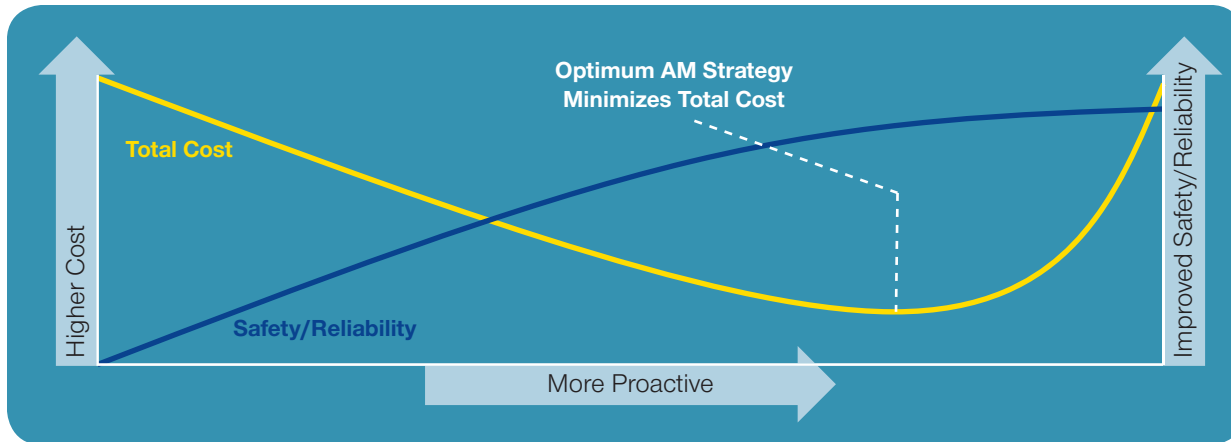


Steam Generator Program Management Plan



The Challenge: Developing a Steam Generator Program Management Plan for the Plant Life

Site Vice Presidents and Plant Manager's Challenge:

Managing a plant's revenue with the variable O&M costs while ensuring the safe, efficient operation of a nuclear plant.

Station Management Staff – Director's and Department Manager's Challenge:

Providing the station upper management implementation plans with associated O&M budget costs for safe, efficient nuclear plant operations in compliance with regulatory requirements.

Steam Generator Program Manager's and Steam Generator Component Engineer's Challenge:

Develop Steam Generator Management Plans for safe, regulatory-compliant / EPRI guideline-compliant operations with O&M budget projection for the life of the steam generators.

AREVA's Solution: A Steam Generator Management and Planning Program Utilizing "MAESTRO"

Program utilizes the AREVA-patented MAESTRO software with other complementary AREVA software tools and AREVA engineering technology and expertise.

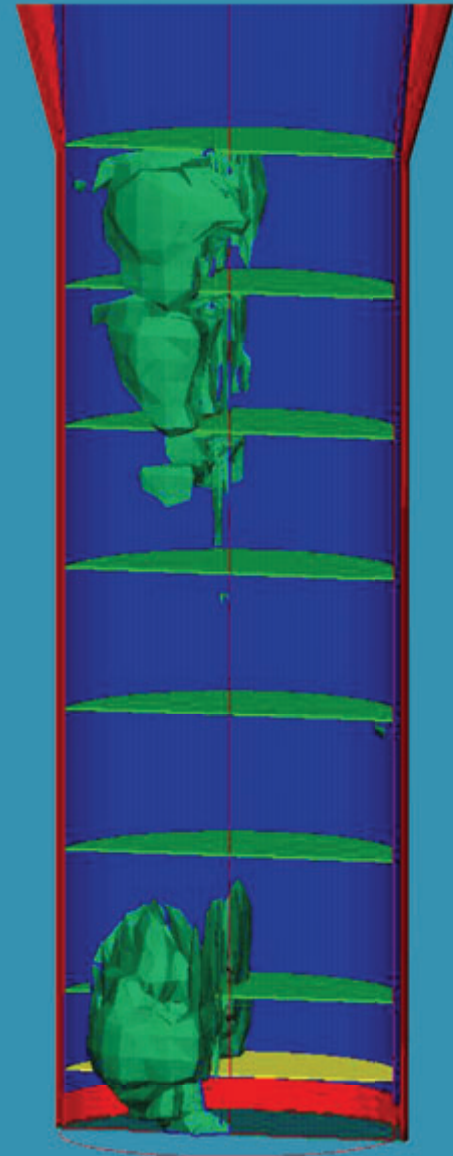
MAESTRO Life-Cycle Management Program for Steam Generators:

- Identifies optimum long-term SG O&M plan among competing alternatives for maintenance tasks
- Develops quantitative basis for outage scope and budget planning during steam generator licensed life
- Utilizes decades of operational expertise with intimate knowledge of the SG design, performance, and maintenance
- Utilizes specialized software tools to model thermal performance, tube degradation, financial performance, and 3D deposit mapping
- Developed and managed with AREVA SG staff expertise in steam generator inspection & repair, chemical cleaning, SG tube integrity assessment, chemistry, 3D deposit mapping, thermal performance, outage planning, and component asset life-cycle management

Examples of MAESTRO Evaluation Tools

Deposit Mapping

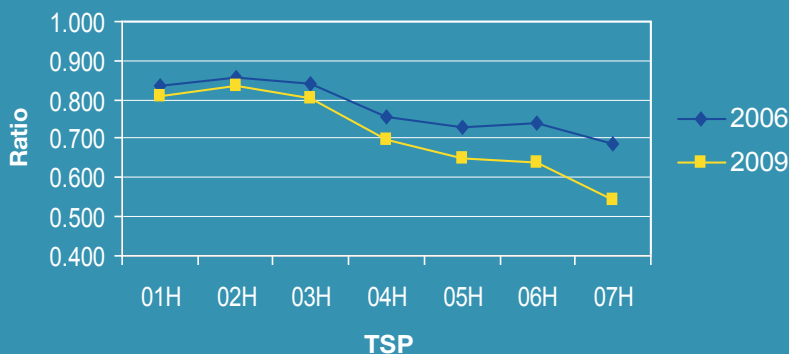
- » Secondary side deposit mapping is an MRI for steam generators
- » The only method of tracking and trending the distribution of SG deposits throughout the tube bundle
- » Provides critical information for effective SG condition management
- » A vital tool in the MAESTRO toolbox



Examples of MAESTRO Evaluation Tools

Tube Support Plate Blockage Monitoring

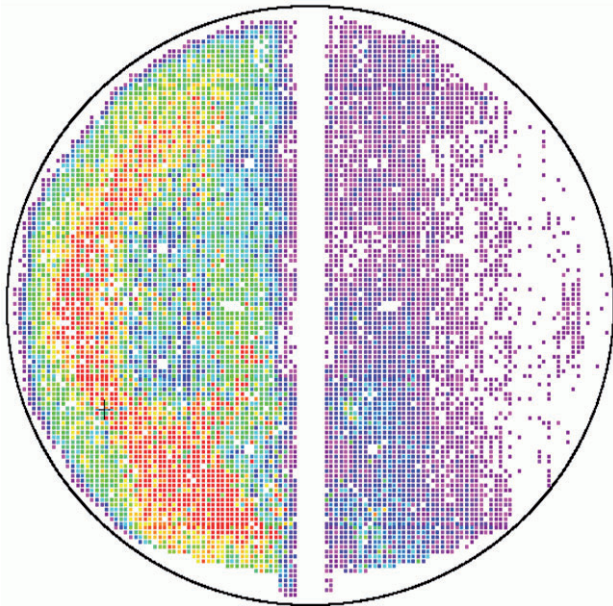
SGC Change in Estimated Area Ratios



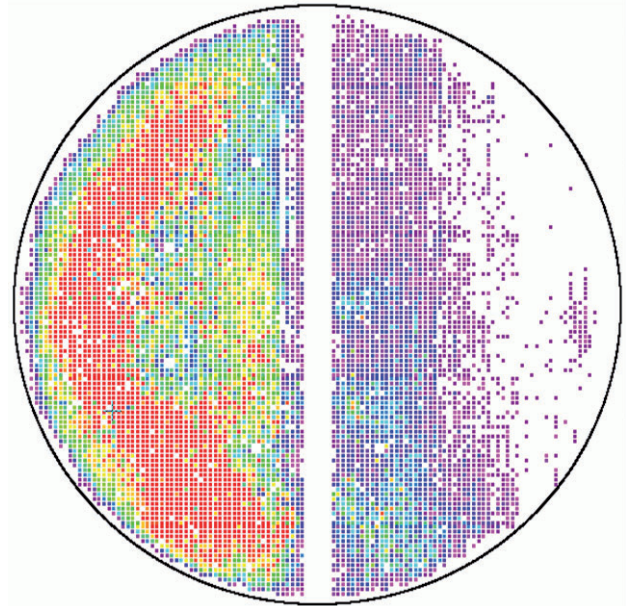
Examples of MAESTRO Evaluation Tools

Tube Support Blockage Monitoring

» Tube support flow blockage increase during three years of operation



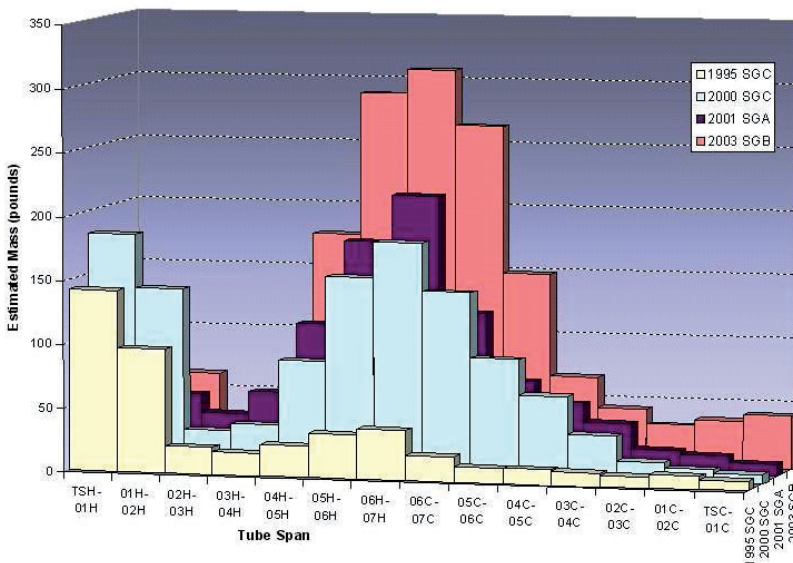
Top Support – 2008



Top Support – 2011

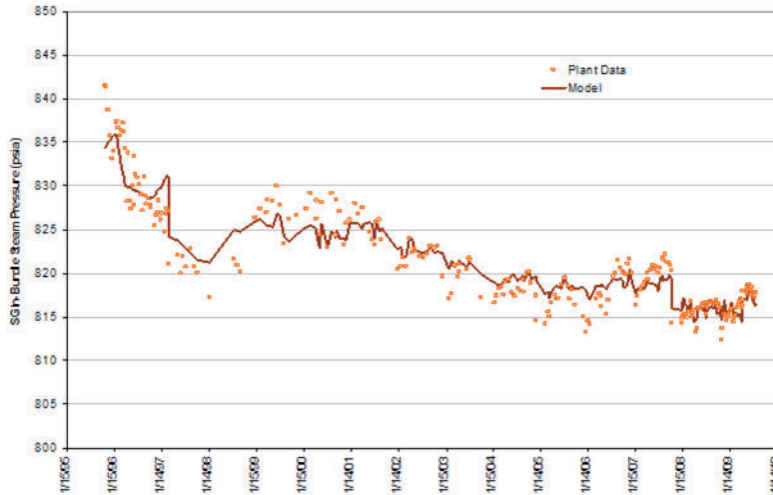
Examples of MAESTRO Evaluation Tools

Free Span Deposit Accumulation Over Time



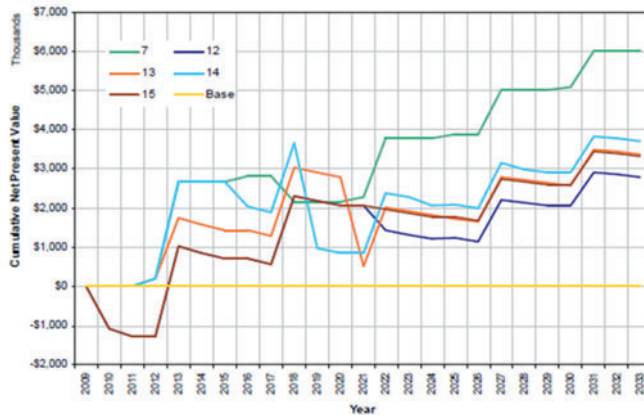
Examples of MAESTRO Evaluation Tools

Modeled Steam Pressure



Examples of MAESTRO Evaluation Tools

CNPV Relative to Alternative Case



AREVA Inc.

For more information, contact:

Dennis Jones

Tel: 434.832.4678

Dennis.Jones@areva.com

Kent Colgan

Tel. 434.832.2925

Kent.Colgan@areva.com

us.areva.com

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