

Historical Overview of Fukushima Forensics Work

A stylized, light gray graphic of an atomic symbol, featuring three intersecting elliptical orbits and two circular nuclei, positioned on the left side of the slide.

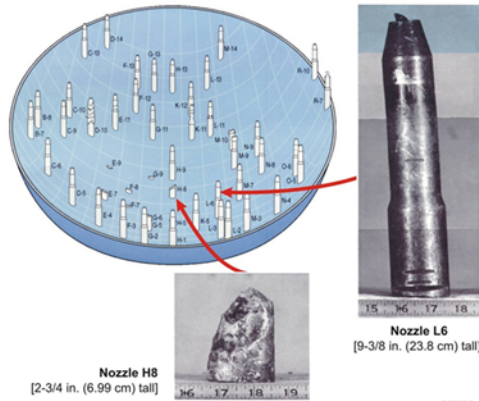
Dr. John E. Kelly

**Vice-President/President Elect
American Nuclear Society**

March 15, 2018

**Forensics of the Fukushima
Dai-ichi Accident
RIC 2018**

US Response Relied on Knowledge from Severe Accident Research

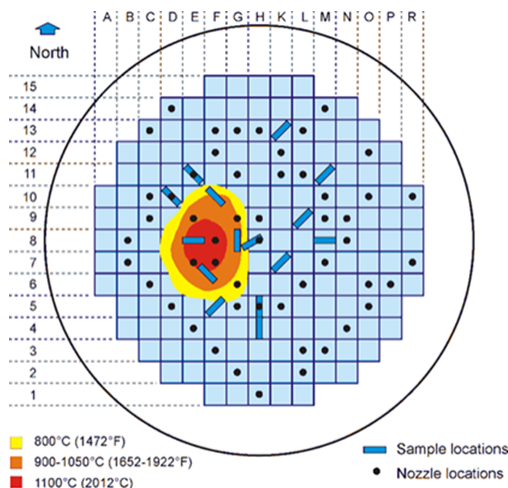


■ Knowledge embedded in Systems Analysis Codes (MAAP, MELCOR) gained from:

- TMI-2 examinations
- Prototypic testing
- Subsequent applications (NUREG-1150, IPEs, SOARCA, etc.)

■ Coordinated US effort relied on long history of prior inter-agency and government-industry cooperation (**US DOE, US NRC, EPRI, INPO, BWROG, PWROG, NEI, etc.**)

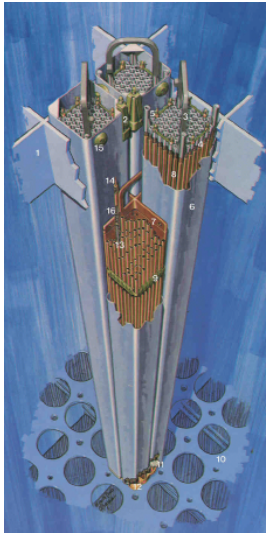
- **Initial Analysis Effort** – Joint US NRC (assisted by DOE laboratory staff) and EPRI Effort
- **Longer-term Forensics Effort** - US DOE led efforts (included US NRC, EPRI, INPO, Owner Groups, Vendors, Plant Owners/Operators, etc.)



Forensics Examination Information - Not an Academic Exercise

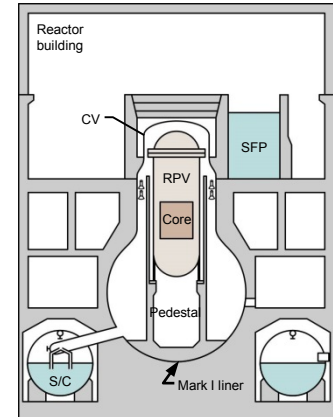


ANS

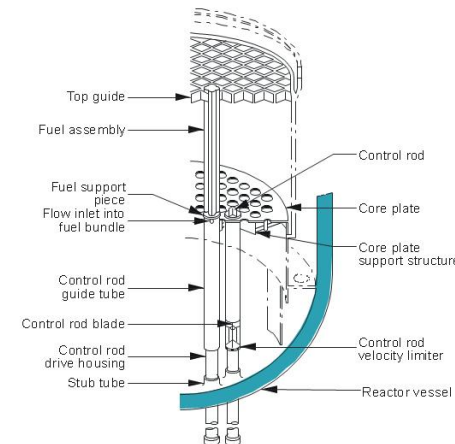


■ Full-scale prototypic data to reduce model uncertainties related to:

- SRV performance
- PCV leakage
- RPV failure
- BWR in-vessel melt progression
- Ex-vessel relocation
- Large-scale core-concrete interaction



■ Information desired to inform industry severe accident management guidance, operator training, emergency planning



Long-Term Approach Used to Generate Forensic Effort Support



■ Domestic - DOE-sponsored US Forensics Effort

- Consensus US information need requests
- Input from industry (BWROG, PWROG, NEI, INPO, EPRI, TVA, Southern, Westinghouse, GE, AREVA, etc.), academia (Texas A&M, Wisconsin, etc.) and national laboratories (ANL, INL, SNL)
- Efforts informed by representatives from TEPCO, JAEA, US DOE, US NRC

Graphics
courtesy of INL

■ Bilateral –Focused US/Japan Interactions under CNWG

- “Practical” Examination Plan Collaboration and Information Exchange
- TMI-2 Knowledge Transfer Workshop

■ International – Japan-led OECD Efforts

- BSAF, SAREF, PreADES, TCOFF, ARC-F

Light Water Reactor Sustainability Program

U.S. Efforts in Support of Examinations at Fukushima Daiichi – 2017 Evaluations

August 2017

U.S. Department of Energy
Office of Nuclear Energy



Summary



ANS

- **Recovery and learning from a severe accident at a nuclear power plant is facilitated by domestic and international collaboration.**
- **After TMI-2, the collaboration between domestic (owner, vendor, EPRI, regulator, and DOE) and international organizations led to successful defueling and implementation of lessons learned to enhance global nuclear safety.**
- **The US has engaged in several activities to ensure that similar benefits from Daiichi examinations will provide**
 - **Japan access to US expertise in plant operations, reactor safety, and cleanup.**
 - **US access to information to reduce uncertainties in severe accident phenomena and to ensure the adequacy of revisions in severe accident guidance.**

Thank You

American Nuclear Society

ans.org

