



U.S. DEPARTMENT OF
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Legacy
Management

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Dr. Modesto Iriarte Technology Museum

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*Session 4.1 – Interpreting the Past and Informing the Future: A Fresh
Look at History and the Preservation of Information Critical to LTS*

Other Contributors

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Overview

- The decommissioned Boiling Nuclear Superheater (BONUS) reactor, located northwest of Rincón, Puerto Rico, was developed as a prototype nuclear power plant to investigate the technical and economic feasibility of the integral boiling superheating concept



2017 aerial image of the BONUS decommissioned reactor site

Overview (continued)

- Following its decommissioning in 1970, the U.S. Atomic Energy Commission (AEC), the predecessor to the Department of Energy (DOE) and Puerto Rico Water Resources Authority (PRWRA), the predecessor to Puerto Rico Electric Power Authority (PREPA), worked together during post-closure to address the remaining residual contamination to safely open the facility to the public for science educational outreach to current and future generations



2017 image of the Museum

History

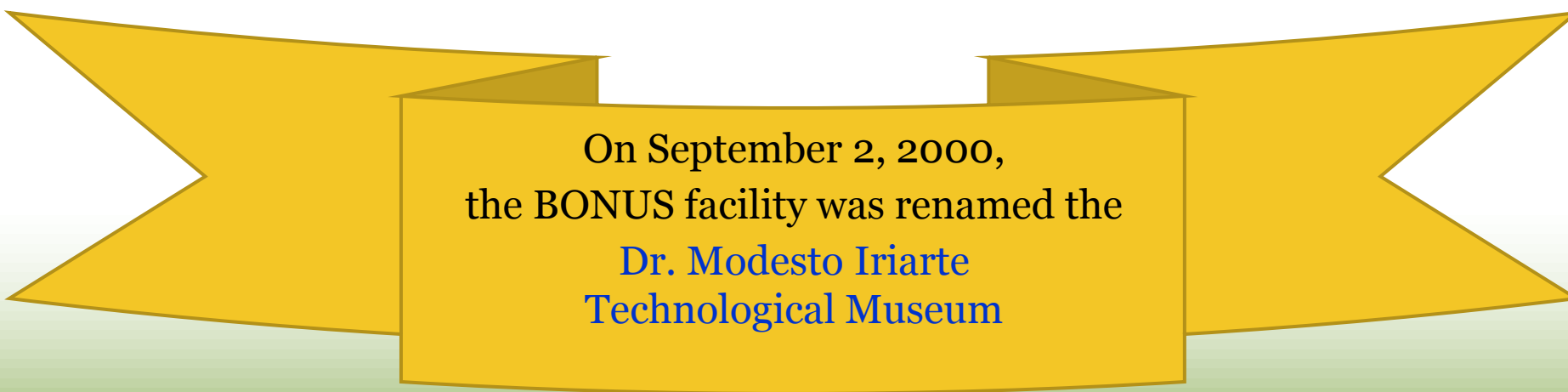
- **1970 to 1995**
 - DOE and PREPA conducted post-decommissioning surveillance and maintenance activities
- **1995 to 2003—Activities to support the museum proposal**
 - In 1995, PREPA proposed to use the reactor building as a museum
 - In 1995, DOE considerations to support the museum proposal were based on PREPA offering to incur the responsibility of maintaining, surveying, and upkeeping the facility following DOE guidance
 - PREPA also committed to provide regular maintenance and immediate response in the event of an emergency and to provide to DOE quarterly surveillance and maintenance data pertaining to the facility
 - Additional actions were taken by DOE and PREPA to support the museum proposal and ensure that radiation protection standards would be met for the public and workers

History (continued)

- **1995 to 2003**—Activities to support the museum proposal (continued)
 - **DOE conducted the following actions:**
 - ✓ Completed full site radiological characterization
 - ✓ Developed and approved the BONUS Radiation Protection Program
 - ✓ Conducted a National Environmental Policy Act Environmental Assessment to evaluate the action of allowing public access to the reactor building, resulting in DOE issuing a Finding of No Significant Impact (FONSI) and, later, a revised FONSI
 - **PREPA conducted the following actions:**
 - ✓ Implemented the Radiation Protection Program
 - ✓ Provided 24/7 security for the facility
 - ✓ Established appropriate administrative and physical controls to minimize or eliminate access to areas of fixed contamination
 - ✓ Isolated and shielded areas of residual radioactive material from visitors and workers
 - ✓ Performed general cleaning
 - ✓ Set up the museum
 - ✓ Painted and covered floors in all areas that would be accessible to the public
 - ✓ Funded and conducted asbestos abatement activities

History (continued)

- **1995 to 2003**—Activities to support the museum proposal (continued)
 - In 1997 a major radiation survey to collect data to support decisions involving the use of the BONUS facility as a museum was conducted
 - The protection of public and worker health was the main emphasis of the survey
 - In 1999 PREPA funded several cost-effective steps to reduce the potential for exposure to radioactive material at the BONUS facility
 - These steps included covering the floor north of the reactor face under the pipe coupling with concrete, general cleaning, prohibiting access to the basement, and painting or otherwise covering floors in all the areas that will be accessible to the public



On September 2, 2000,
the BONUS facility was renamed the
**Dr. Modesto Iriarte
Technological Museum**

History (continued)

- **2003 to 2010**—Museum preparation studies and responsibility agreements
 - In February 2003, DOE signed a FONSI to allow public access to the main floor of the BONUS reactor building
 - In 2007, the BONUS facility was listed on the National Register of Historic Places
 - In 2008, PREPA poured a layer of concrete over the basement floor of the reactor building and sealed all drains as an additional protective measure
 - In February 2009, DOE signed a Revision of FONSI to allow access to the basement area of the BONUS reactor building
 - In June 2009, personnel of both the DOE Office of Legacy Management (LM) and PREPA inspected the BONUS reactor building and the associated remaining equipment and determined that physical and administrative controls were working and sufficient to protect the public

History (continued)

- **2003 to 2010**—Museum preparation studies and responsibility agreements (continued)
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History (continued)

- **2003 to 2010**—Museum preparation studies and responsibility agreements (continued)
 - In August 2010, LM and PREPA finalized a Letter of Agreement (LOA)
 - The LOA states that controlled public access to the BONUS reactor building is allowed
 - Both the main and basement level of the reactor building are available for public access for the purpose of a museum
 - The LOA also formalizes the relationship between LM and PREPA as it relates to radiation protection and radioactivity levels remaining at the site:
 - Under the LOA, *LM is responsible* for providing radiological oversight and for performing maintenance and restoration of the entombment to a safe condition (from a radiological standpoint), or other appropriate action in the event that the containment is disturbed in the future by natural deterioration or accident, or is otherwise determined by DOE to be inadequate
 - Under the LOA, *PREPA is responsible* for conducting radiological measurements for the facility and a comprehensive annual survey and inspection to assess radiological conditions throughout the facility, recordkeeping and reporting, and facility control and maintenance

Today

- **2010 to Present—Ongoing LM activities**

- LM has long term stewardship responsibilities for the entombment which includes periodic site inspections and radiological oversight of the radiological protection program implemented by PREPA
 - LM conducts inspections every three to five years
 - The objective of LM inspections is to confirm the integrity of the entombed reactor system, the containment building, site security, general housekeeping, and condition of the surrounding land



Exterior walk down of the facility.



Inspection team entering facility

Today (continued)

- **2010 to Present—Ongoing PREPA activities**
 - PREPA has responsibility for conducting radiological measurements in accordance with the approved Radiation Protection Program for the facility; record keeping and reporting; and facility control and maintenance
 - Operate the museum which is normally opened to the public four times a year and averages around 100 visitors annually



Boy Scouts participated in education outreach hosted by PREPA.

Today (continued)

- **2010 to Present—Ongoing PREPA activities**
 - The museum contains numerous displays that recount the history of the BONUS site as well as the development of electric power and nuclear energy
 - The reactor control room is still intact and, although it is inactive, control lights have been wired to display an operational effect



Today (continued)

- **2010 to Present—LM/PREPA joint activities**
 - In August 2018, LM hosted PREPA for three visitor center tours so they could experience first-hand LM initiatives towards public outreach and possibly take ideas back for incorporation at the Dr. Medesto Iriarte Technology Museum



Fernald Preserve Visitor Center



Weldon Spring Interpretive Center



Mound Cold War Discovery Center

Future

- LM will continue to partner with PREPA such that the museum strengthens its reach to their stakeholders by:
 - Linking PREPA webpage for the Museum to LM BONUS website
 - Collaborating with PREPA on expanding museum hours of operations
 - Exchanging ideas on incorporating interactive exhibits
 - Sharing lessons learned



*Management in front of the Museum in May 2017.
Left to Right: Cliff Carpenter (LM),
Rafael Marrero Carrasquillo (PREPA), Carmelo
Melendez (LM), and Orlando Rivero (PREPA)*