

The Process for Receipt of Test, Research and Training Reactor Spent Nuclear Fuel (SNF)

Dale E. Luke, Advisory Engineer

K. Alan Robb, Fuel Receipt Engineer

Steven D. Wahnschaffe, Principal Engineer



Restructuring of the INL

- ◆ **The Idaho National Laboratory (INL) managed by Battelle Energy Alliance (BEA) contains the laboratory and R&D functions.**
 - INL is a DOE-Nuclear Energy (DOE-NE) entity
 - INL is DOE-NE's first national laboratory
- ◆ **The Idaho Completion Project (ICP) managed by CH2M-WG Idaho (CWI)**
 - Is responsible for the remediation and cleanup of the INL site (non-lab facilities)
 - Is responsible for the receipt of SNF and the storage, packaging, and shipment of SNF and HLW
 - ICP is the DOE-Environmental Management (DOE-EM) entity

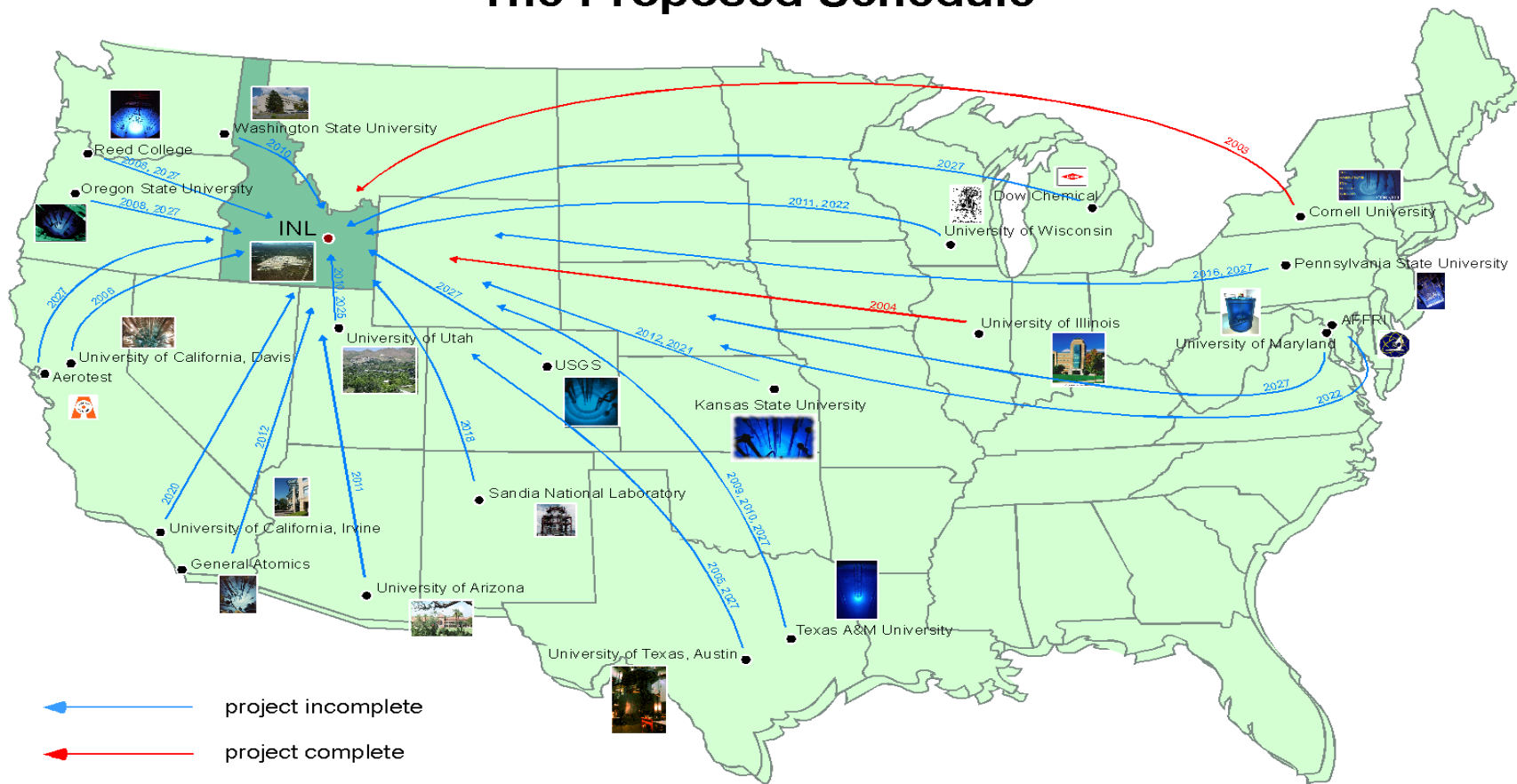
CH2M-WG Idaho (CWI) contract

- ◆ Seven year contract for cleanup
- ◆ Offsite receipts will be included in the contract

Foreign Research Reactor Location with TRIGA Spent Nuclear Fuel (Participating with the INL)



Domestic TRIGA Reactors Participating with the INL The Proposed Schedule



Recent TRIGA SNF Receipts at the INL - Foreign Receipts

- ◆ Korea – three casks
- ◆ Germany – one cask
- ◆ Italy – one cask
- ◆ Romania – one cask
- ◆ Slovenia – two casks
- ◆ England – one cask
- ◆ Germany – three casks
- ◆ Japan – one cask
- ◆ Indonesia – two casks

Recent SNF Receipts at the INL - Domestic Receipts

- ◆ West Valley – PWR and BWR fuel, two casks
- ◆ Oak Ridge – miscellaneous fuel, five casks
- ◆ General Atomics - miscellaneous fuel, one cask
- ◆ Cornell University – TRIGA fuel – one cask
- ◆ University of Illinois – TRIGA fuel – two casks

Status of Ongoing and Near-term SNF Receipts at the INL

- ◆ **State University of New York (SUNY)-Buffalo**
 - Fall 2005
 - PULSTAR fuel
 - Preparations are well underway
- ◆ **University of Texas A&M**
 - Late 2005
 - TRIGA fuel
- ◆ **Out-year: domestic and foreign shipments are in negotiation.**

INL Receipt Process

- ◆ Shipper notify DOE-ID
- ◆ Shipper and DOE-ID determine how SNF will be transported (CWI can currently receive the NAC-LWT & 18.5 T casks with TRIGA SNF)
- ◆ Shipper determines condition of SNF
- ◆ Shipper provides fuel and packaging data
- ◆ CWI reviews/approves data. Verifies fuel can be stored.
- ◆ Shipper consults with DOE-ID for shipping time frame
- ◆ Shipper loads and ships SNF (CWI verifies loading)

Major Lessons Learned

- ◆ **Early communication and accurate fuel data are vital.**
- ◆ **Notify DOE-Idaho Operations Office (DOE-ID) of the intent to ship as soon as you foresee a need to ship.**
- ◆ **Provide a complete draft of the Required Shipper's Data form in a timely manner.**

CWI Equipment and Resource Capabilities



Fuel Examination/Loading

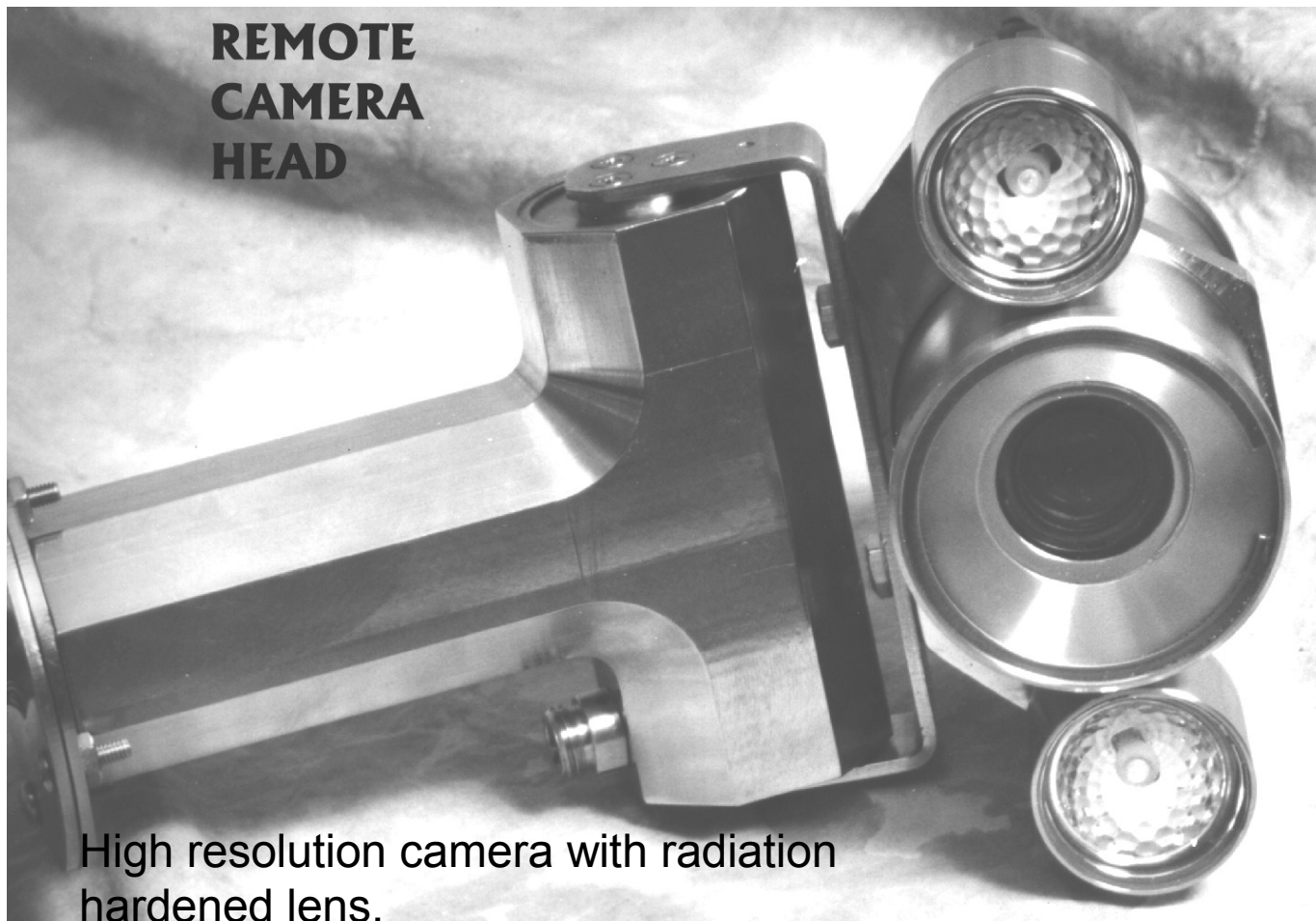
- ◆ **Equipment**
 1. **Underwater video camera systems consisting of camera head with zoom, focus, and pan-and-tilt capability, radiation hardened lens, and integral underwater lights**
 2. **Video monitors and high definition recorders**
- ◆ **Pre-defined acceptance criteria**
- ◆ **Trained personnel**

CWI Equipment



Equipment used for inspections/loading of fuel

**REMOTE
CAMERA
HEAD**



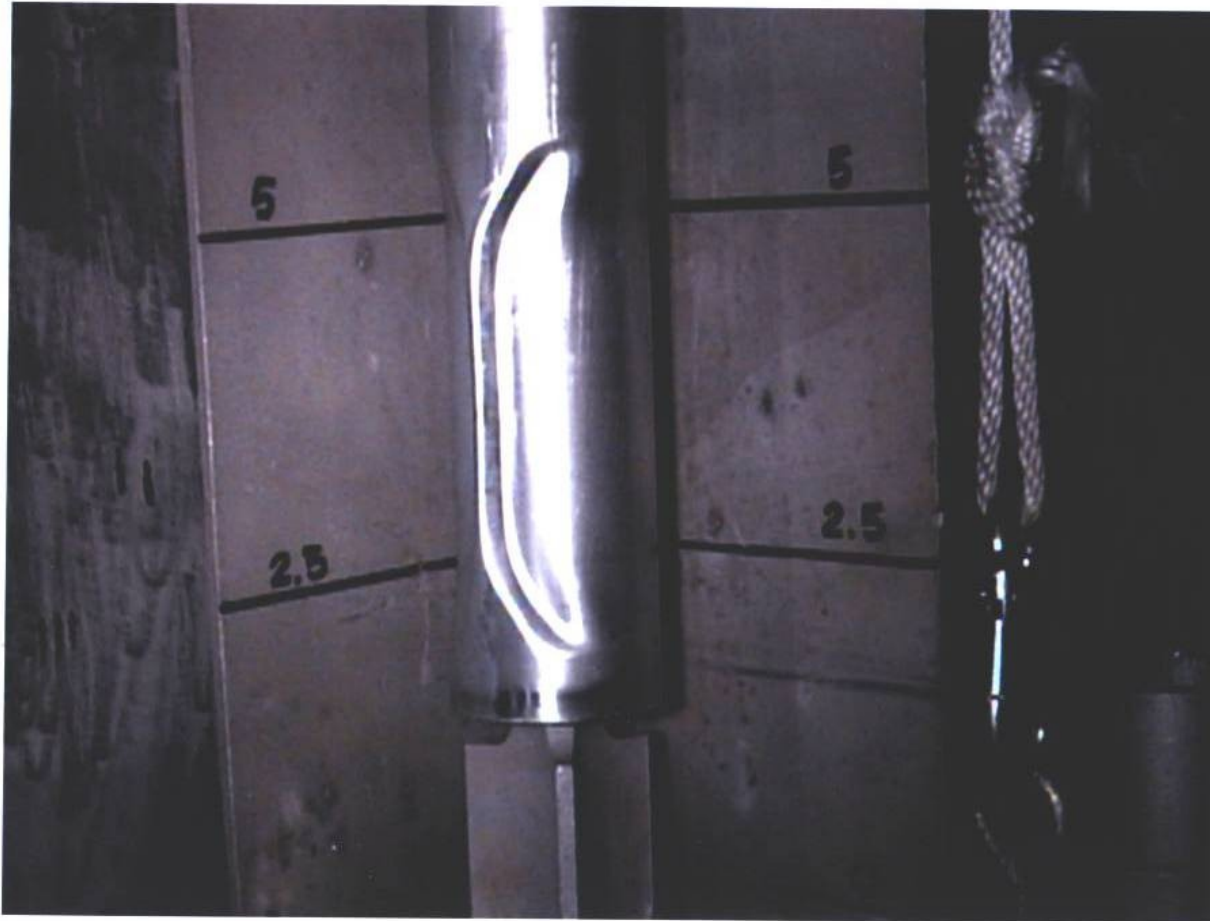
High resolution camera with radiation hardened lens.

Sample Findings of Fuel Examinations

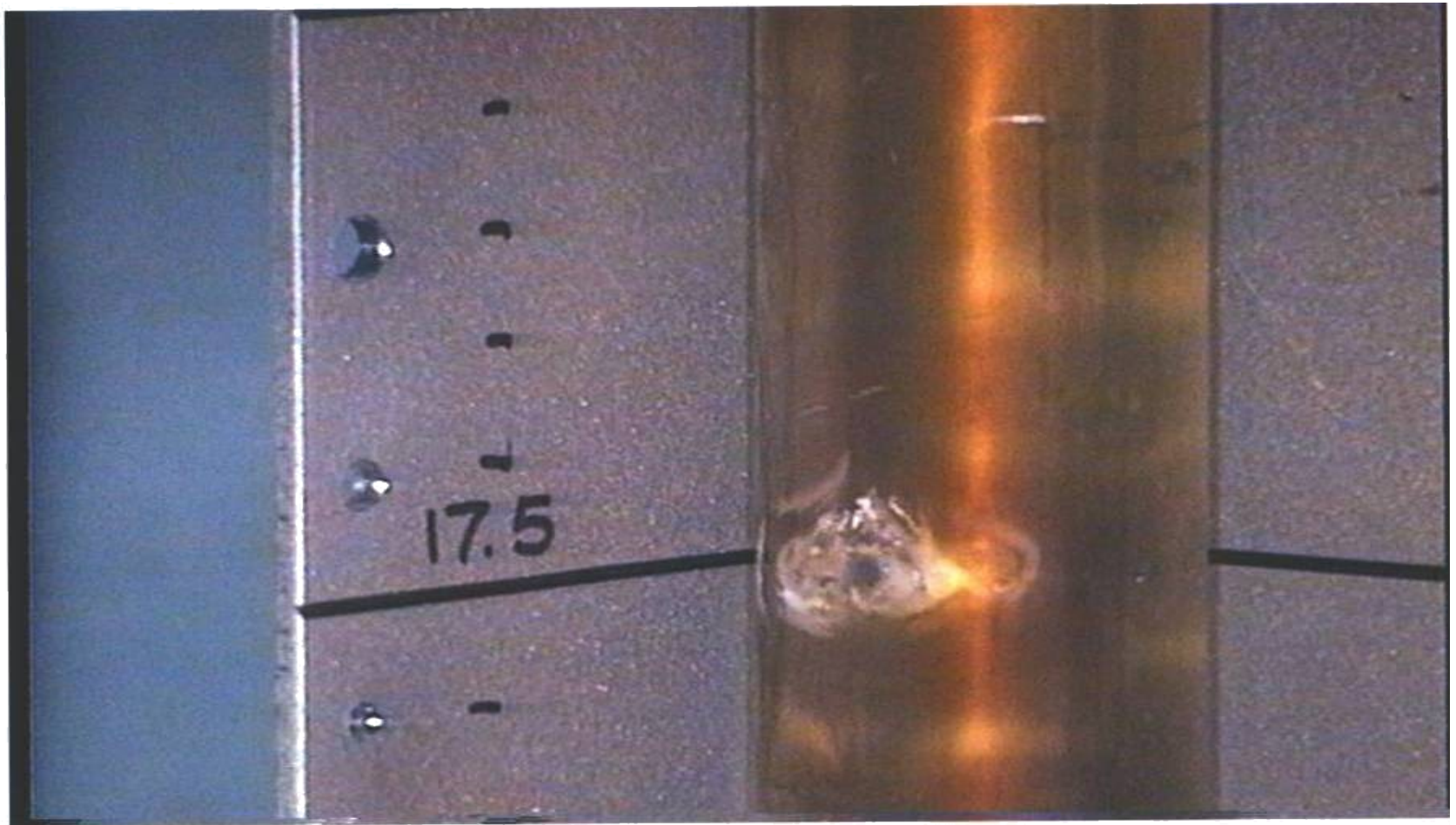
Modified AL clad TRIGA fuel element



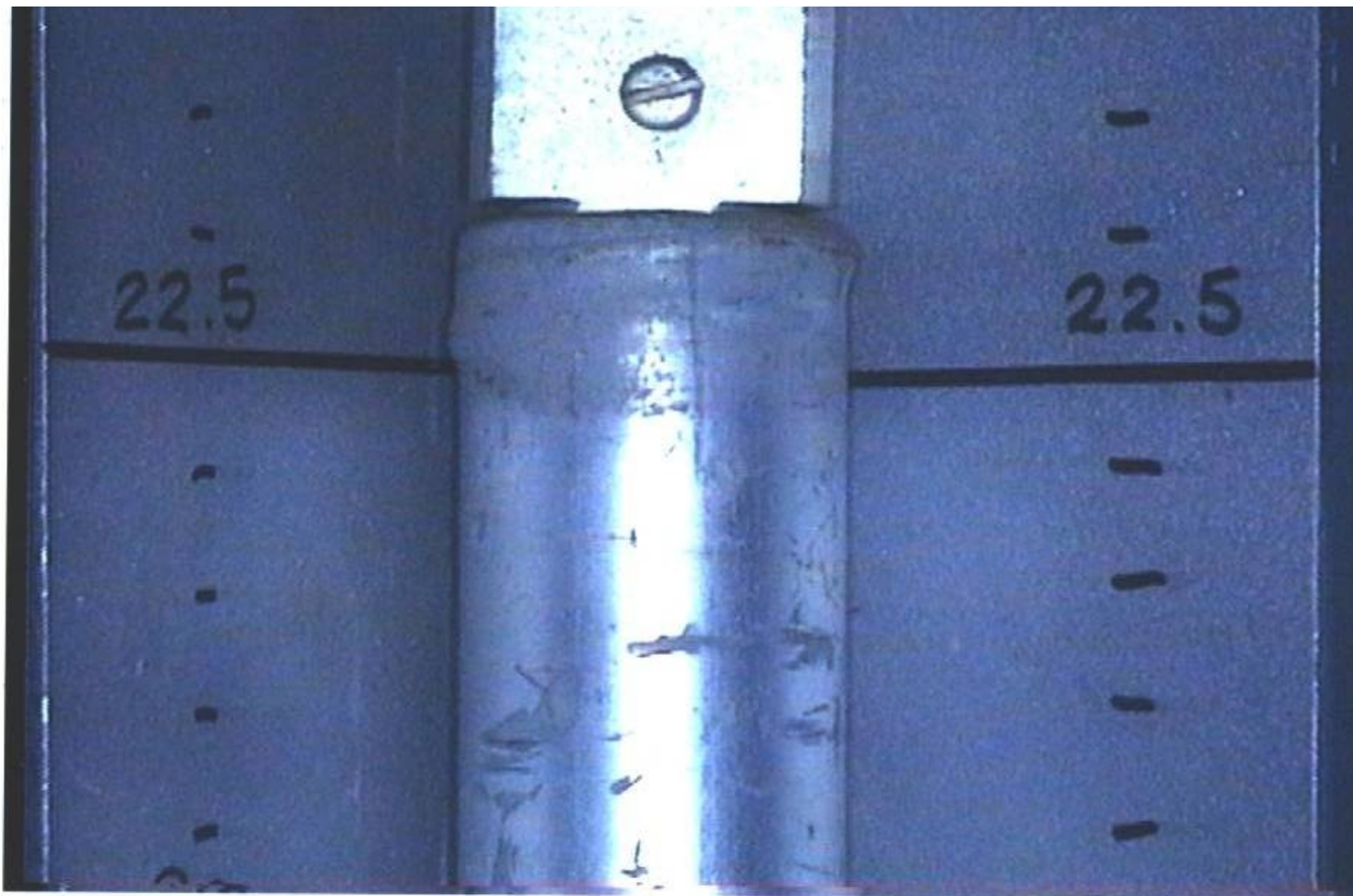
Damaged SS clad element (collapsed)



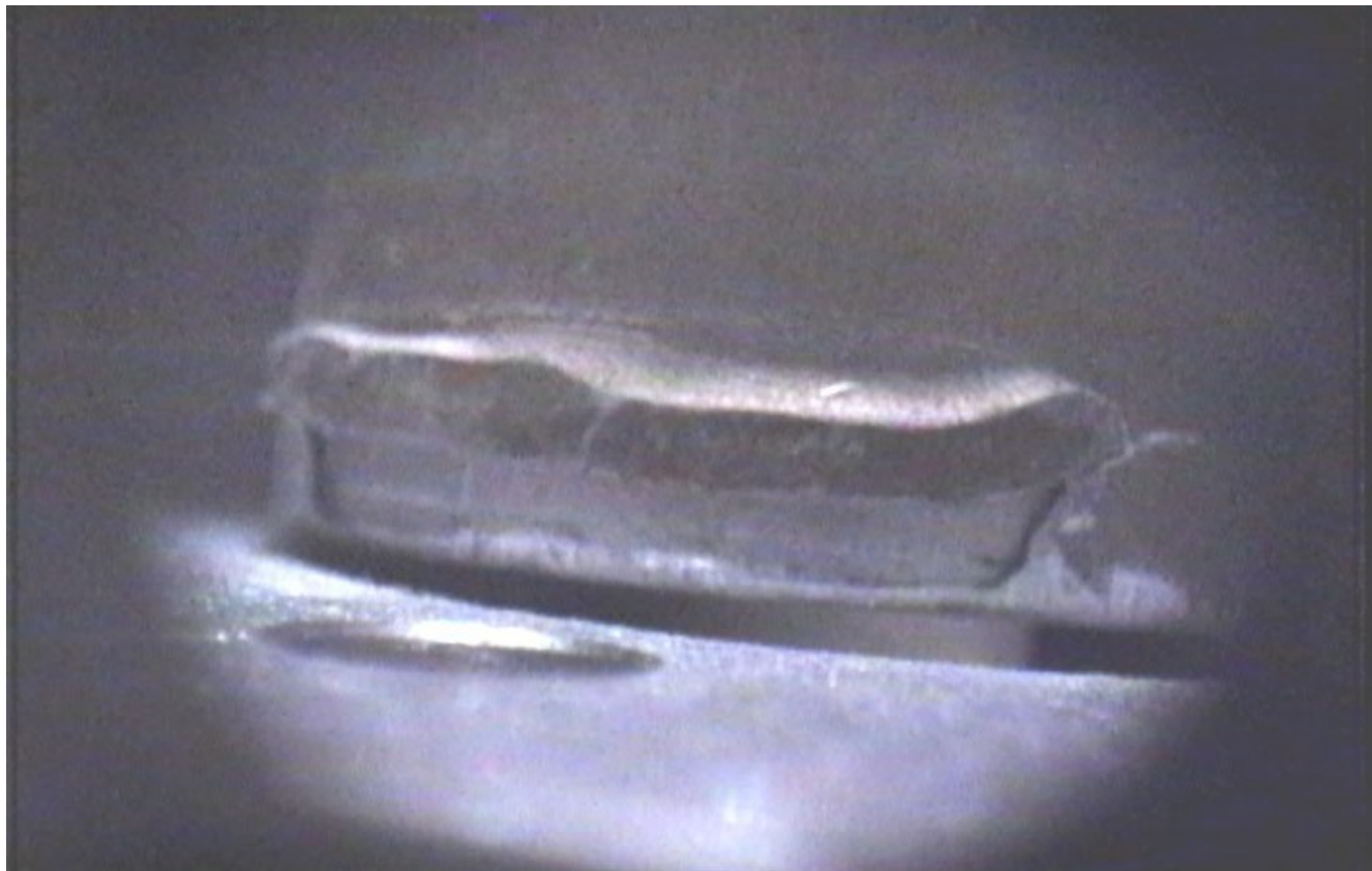
Damaged SS clad element (pitted)



Damaged Al clad element (bulged)



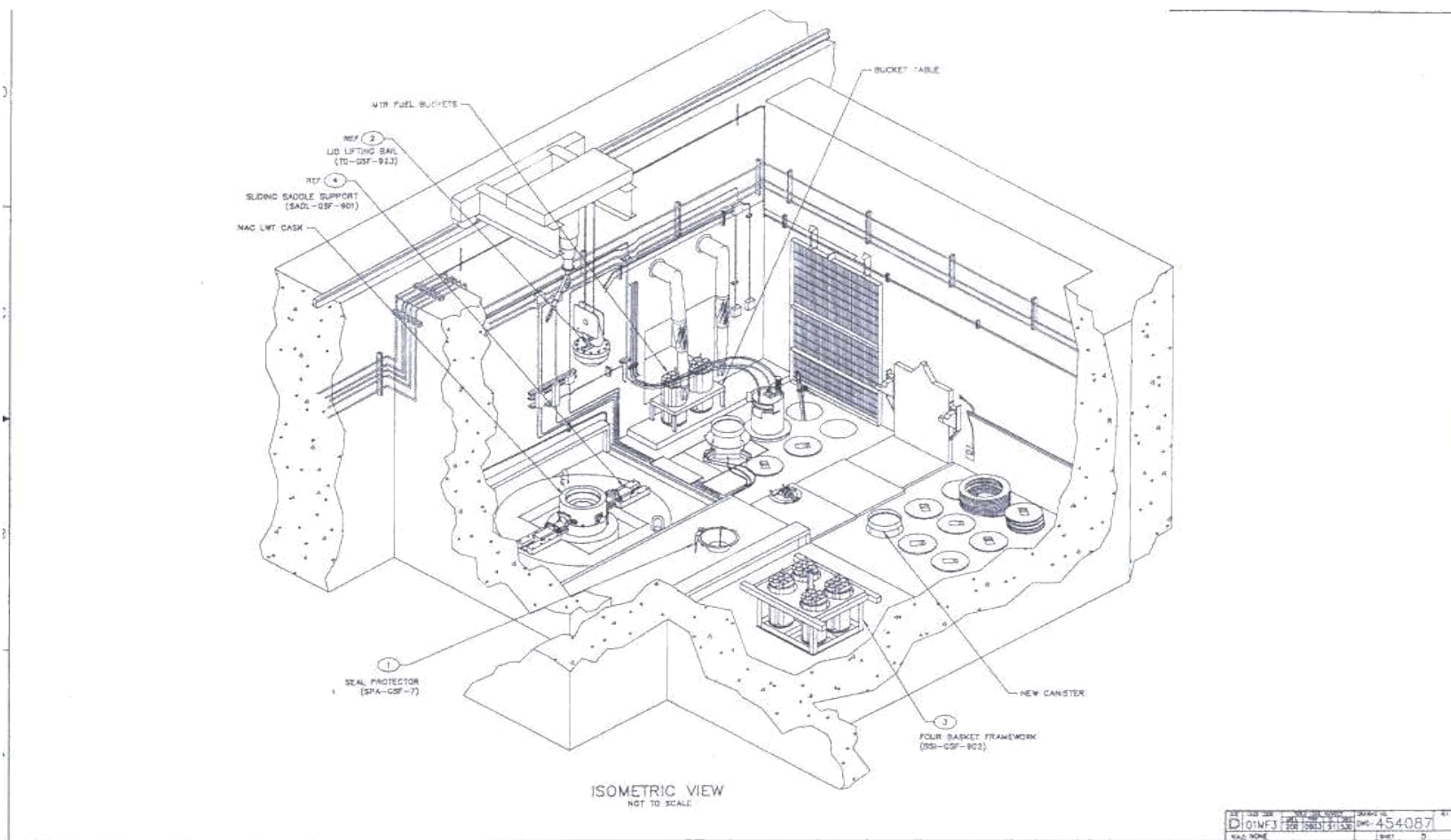
Damaged Al clad element (ripped)



CWI Managed Dry Storage Facility



Dry Storage Fuel Handling Cave

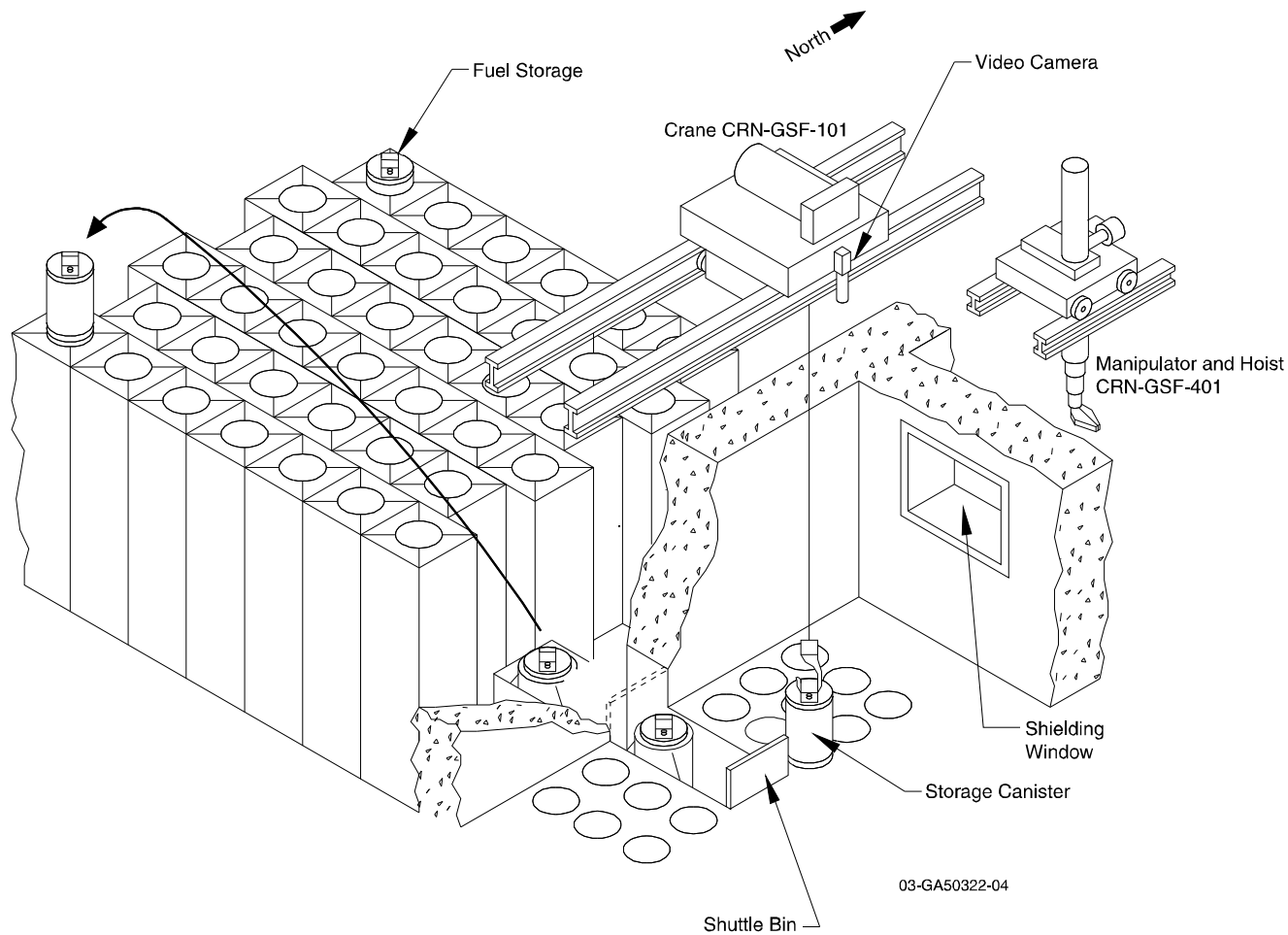


Dry Storage Fuel Handling Cave

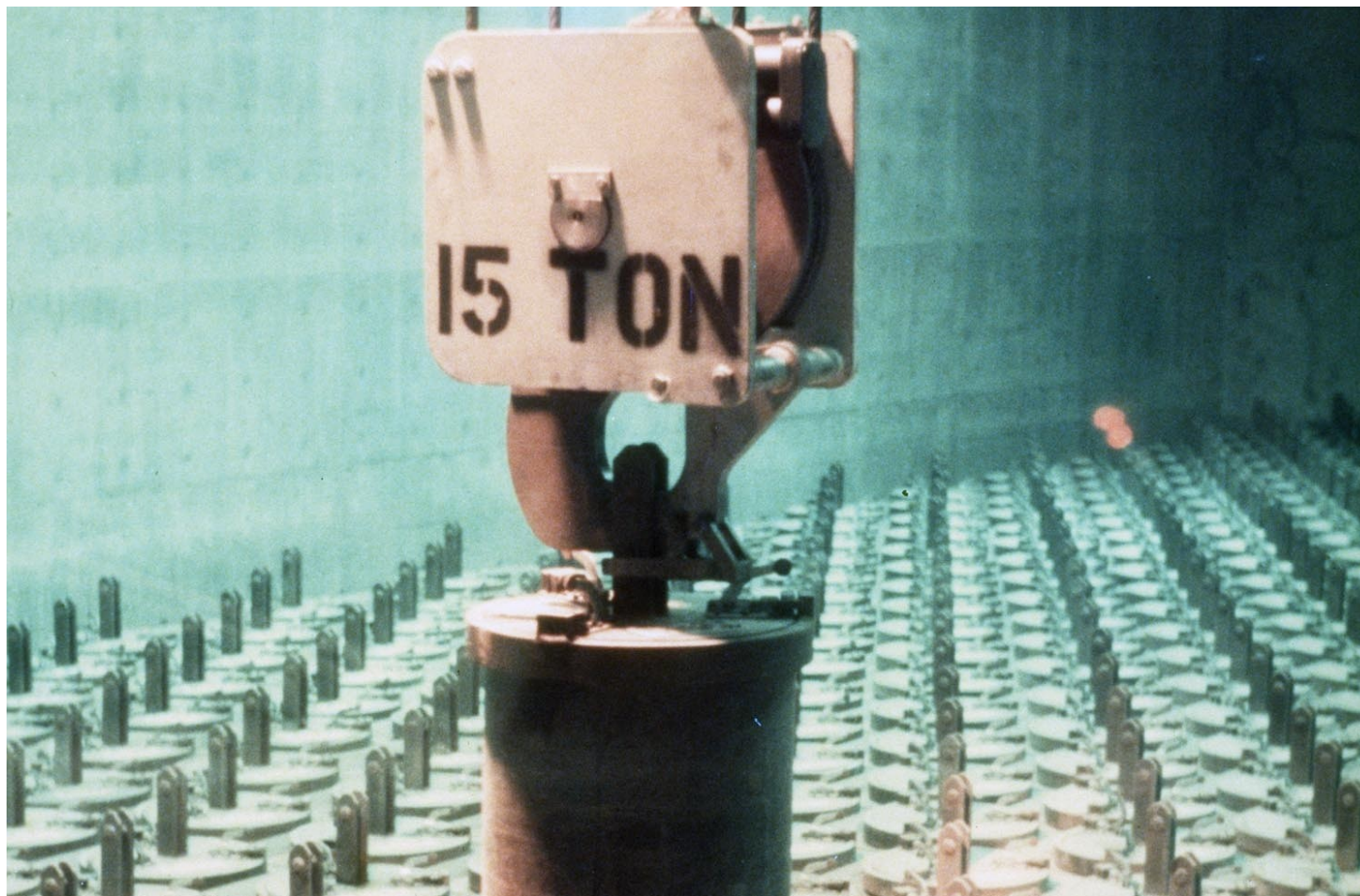


CPP-603, Fuel Handling Cave, Facing South

Dry Storage Fuel Storage Area



How Fuel is Stored in the Dry Fuel Storage Area



Questions and Discussion

