



50-344

UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 24, 1996

LICENSEE: Portland General Electric Company

FACILITY: Trojan Nuclear Plant

SUBJECT: SUMMARY OF MEETING HELD ON SEPTEMBER 11, 1996, TO DISCUSS THE  
TROJAN SPENT FUEL POOL DEBRIS RECOVERY PROGRAM

On September 11, 1996, the NRC held a meeting with Portland General Electric (PGE) at NRC Headquarters in Washington, DC. The meeting was open to the public. No members of the public attended. Members of the NRC and the licensee that attended the meeting are listed in the attached attendance roster (Attachment 1). A copy of the licensee's handout is also attached (Attachment 2).

The purpose of the meeting was to inform the NRC staff of the licensee's plans to separate a category of material called spent fuel pool debris. This material consists of damaged spent fuel, welding dross from previous core barrel modifications, other non-fuel bearing components, and organic (plastic) filter materials. The spent fuel pool debris is stored in specially designed "garbage" cans at a number of locations in the spent fuel pool. The purpose of this effort is to separate the fuel and core debris from materials that could potentially produce gas, primarily hydrogen. The licensee plans to package this material in canisters that would be suitable for storage in an ISFSI. Material that produces gas due to any phenomenon, including radiological decomposition, would be unacceptable for storage in an ISFSI. The licensee proposes to use a steam reformer resulting in the pyrolysis of the organic compounds. The fuel debris and filter material will be packaged in canisters and subjected to a low flow (1 to 3 cfm) high temperature (1100 degrees F) steam under approximately atmospheric pressure for a number of hours. The effluent stream is subjected to higher temperatures (>2000 degrees F) in a proprietary quartz chemical reactor. Discharge gases will be cooled, HEPA filtered, and discharged to the plant ventilation system at ambient temperature. The canister containing the material remaining after the steam reforming would be packaged in capsules and then sealed into the ISFSI canisters.

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September 24, 1996

The licensee has determined that this activity has the potential for a new and different accident than any evaluated in the Defueled Safety Analysis Report. Therefore, the licensee has concluded that the activity involves an unreviewed safety question. The licensee plans to submit a Safety Analysis Report on the spent fuel pool debris recovery program in October 1996. The licensee hopes to begin processing the fuel debris by the end of calendar year 1996.

Original signed by:

Michael T. Masnik, Senior Project Manager  
Non-power Reactors and Decommissioning  
Project Directorate  
Division of Reactor Program Management  
Office of Nuclear Reactor Regulation

Docket No. 50-344

Attachments:

1. Attendance Roster
2. Licensee Handout

cc w/attachments: See next page

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Docket File 50-344

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JMitchell (Region IV)

WRussell/FMiraglia

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EJordan

NRC Participants

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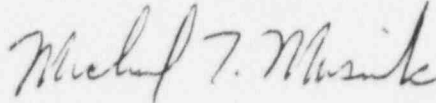
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Michael T. Masnik, Senior Project Manager  
Non-power Reactors and Decommissioning  
Project Directorate  
Division of Reactor Program Management  
Office of Nuclear Reactor Regulation

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cc w/attachments: See next page

Mr. Stephen M. Quennoz, Acting  
Portland General Electric Company

Trojan Nuclear Plant  
Docket No. 50-344

cc:

Mr. Michael J. Sykes, Chairman  
Board of County Commissioners  
Columbia County  
St. Helens, Oregon 97501

Mr. David Stewart-Smith  
Oregon Department of Energy  
Salem, Oregon 97310

Regional Administrator, Region IV  
U.S. Nuclear Regulatory Commission  
Harris Tower and Pavilion  
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Do It Yourself Committee  
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Hillsboro, Oregon 97124

Mr. Eugene Rosolie  
Northwest Environmental Advocates  
302 Haseltine Building  
133 S.W. 2nd Avenue  
Portland, Oregon 97204

## TROJAN FUEL DEBRIS RECOVERY PROGRAM

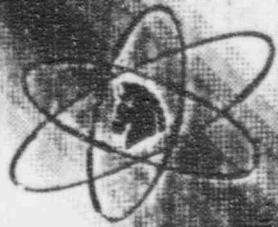
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TWFN, Rockville, MD

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**Spent Fuel Pool Debris Project**

**September 17, 1996**

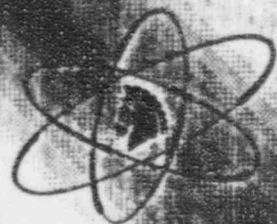


# Spent Fuel Pool Debris Project

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- Prepare Material Currently Stored in the Spent Fuel Pool for ISFSI Storage
  - Fuel material
  - Filter materials (containing organic compounds)
  - Non- fuel bearing components (NFBC)
  - Greater than Class C (GTCC) Material
- Eliminate materials that are capable of producing gas





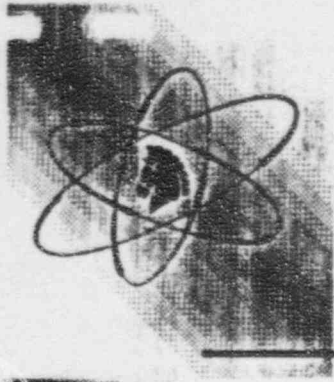
# Material Preparation

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- Material Inventory
- Material Segregation
  - GTCC and NFBC returned to canisters
  - Low-level Waste (LLW) removed and packaged for disposal
  - Remaining material (fuel, filters and mixed material) will be packaged for thermal processing/steam reforming





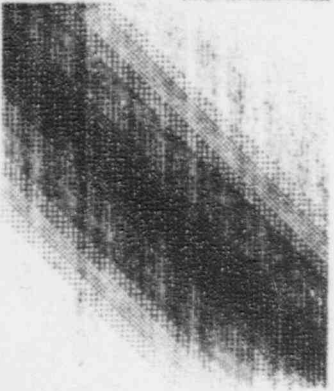
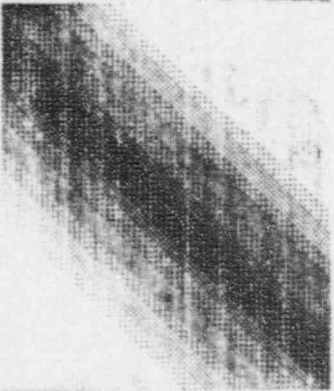
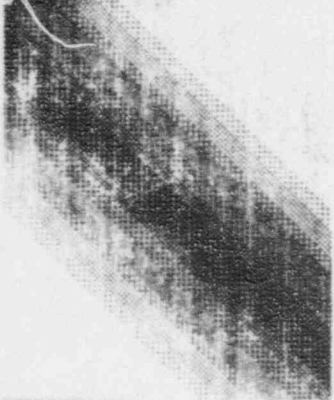


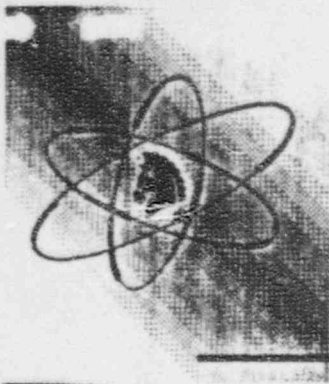
# Debris Processing (cont.)

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## ■ Debris Removal

- Cofferdam used to confine material and maintain water clarity
  - Connection to existing underwater vacuum

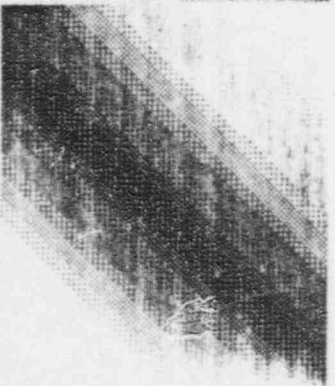
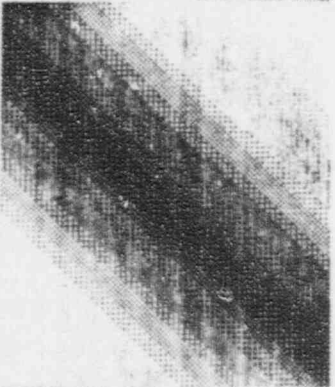
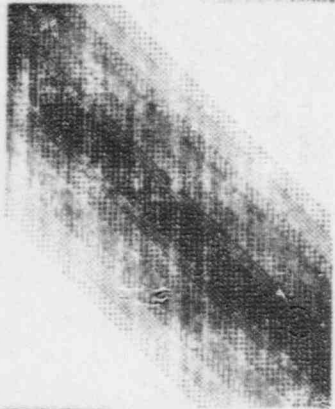


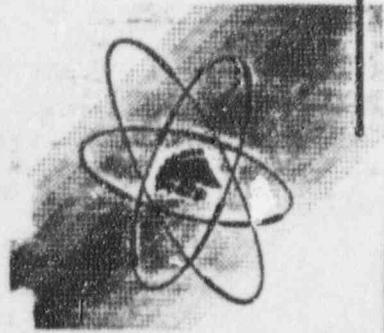


## Debris Processing (cont.)

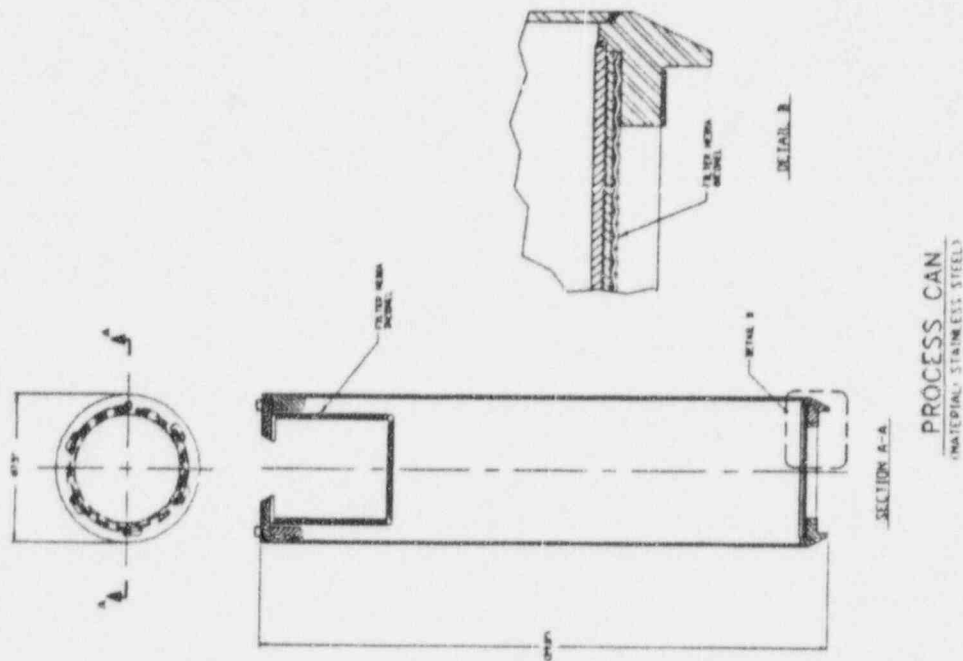
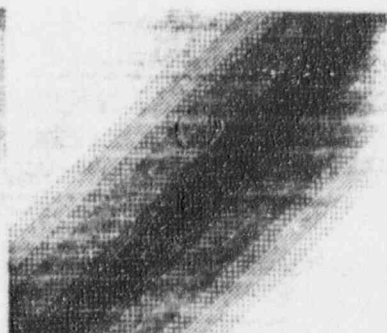
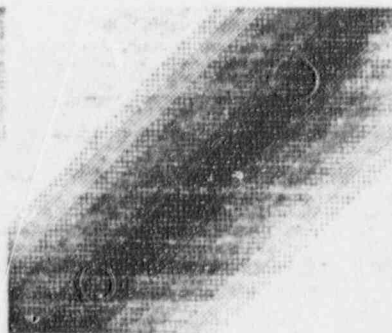
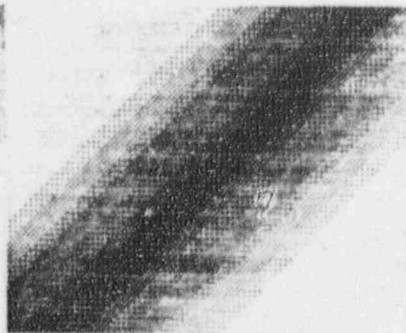
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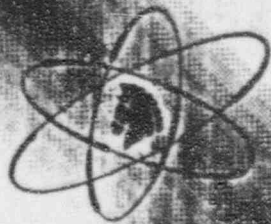
- **Process Canister**
  - Containerizes material for thermal processing
  - Constructed of stainless steel
  - 5 micron metallic filters in top and bottom





# Process Canister

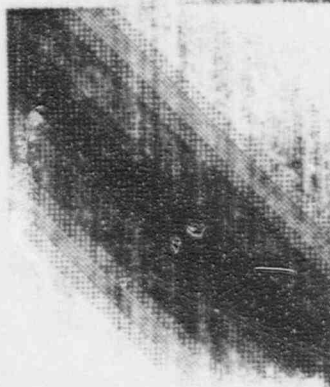
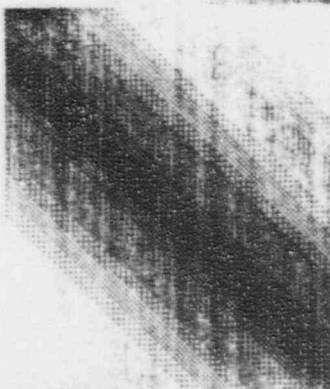
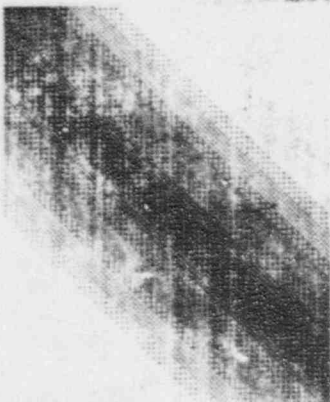




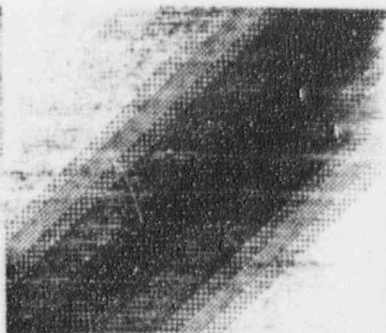
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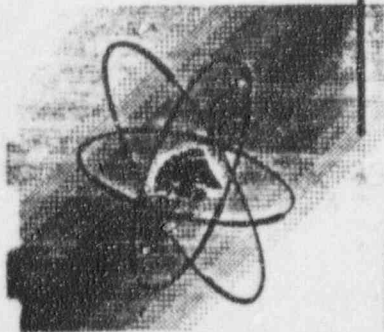
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- **Process Canister Transfer Operation**
  - Transfer bell interfaces with:
    - Canister removal station
    - Can feed evaporator
    - Capsule loading station

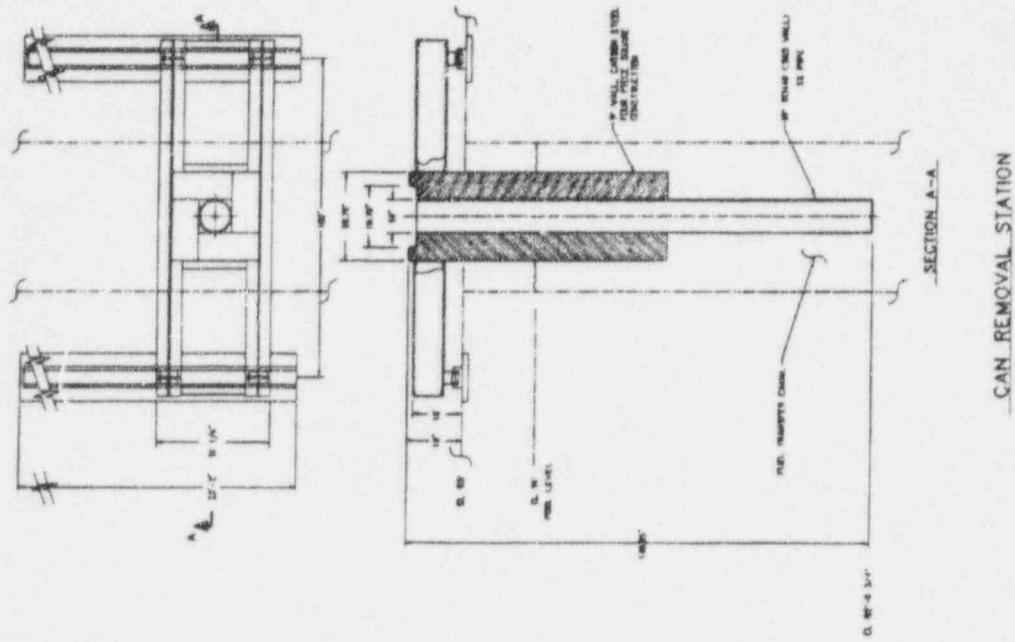
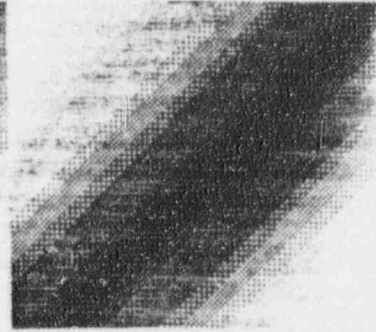
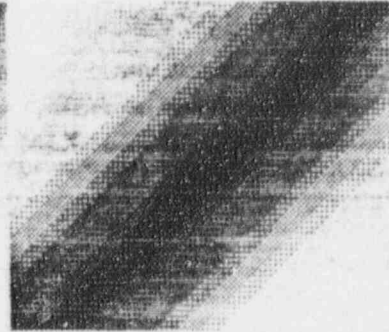
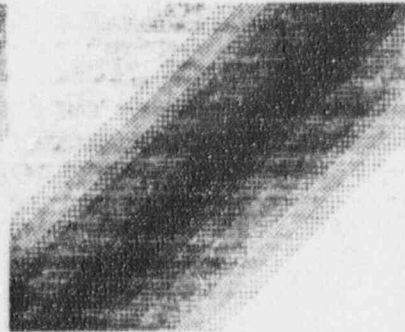




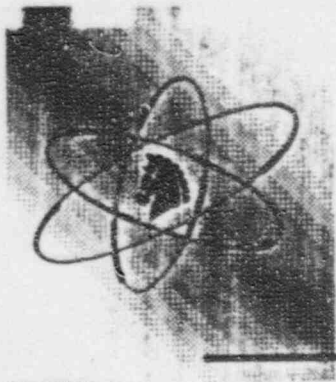
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# Canister Removal Station







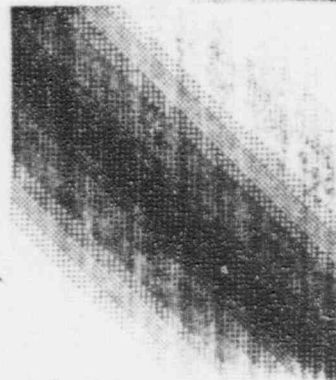
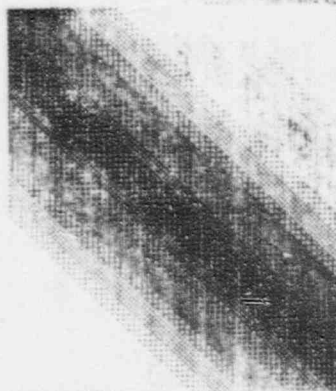
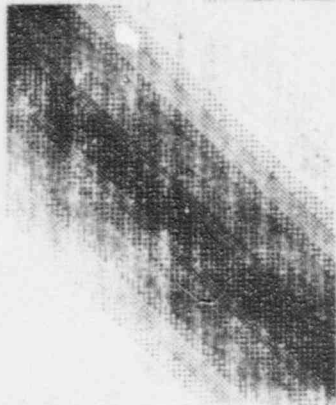
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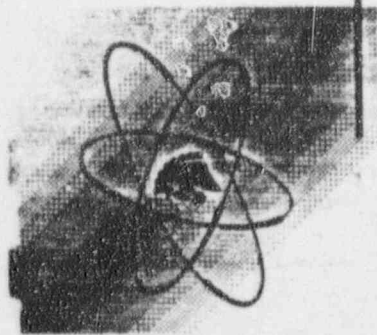
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### ■ Steam Reforming

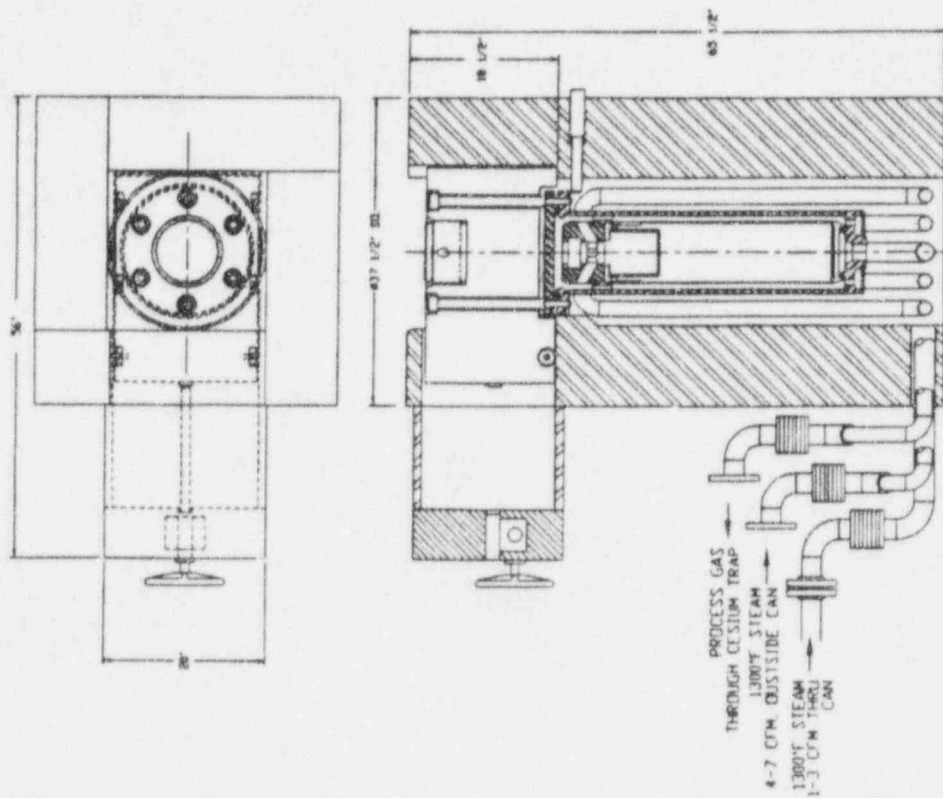
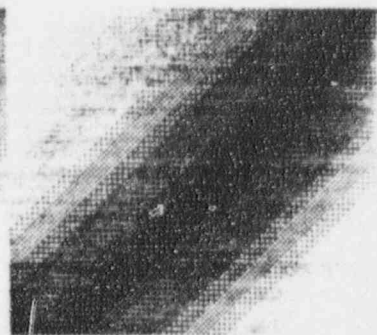
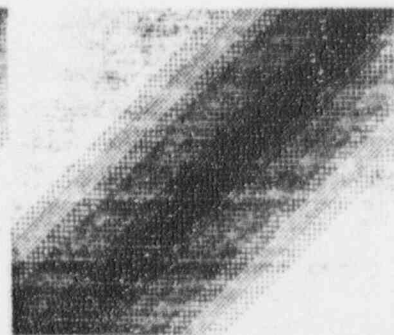
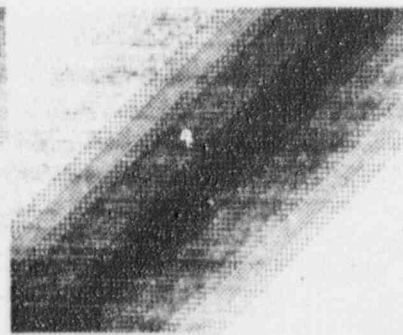
#### – Can feed evaporator

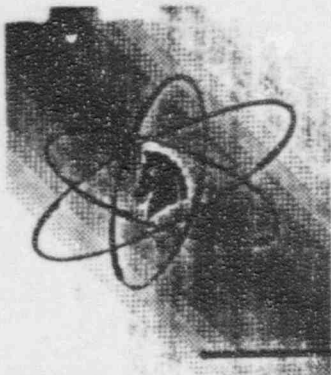
- Maintains process canister in shielded environment during steam reforming
- 50 mR/hr - contact with 350 R/hr process canister
- Operating environment - 593 degrees C (1100 degrees F) - inert - slight negative pressure





# Can Feed Evaporator



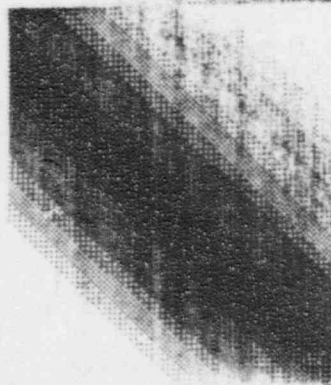
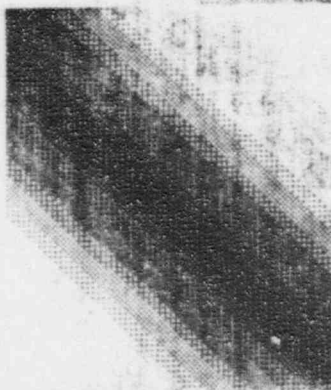
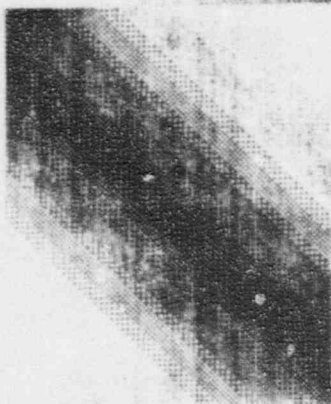


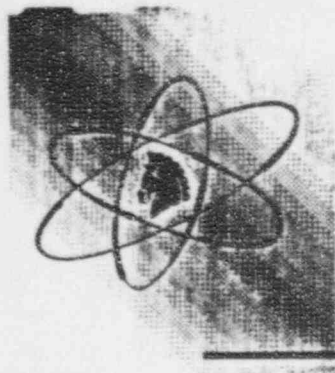
## Debris Processing (cont.)

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### ■ Steam Reforming

- Treats organic materials in process canister
- Removal capability for materials that are capable of producing gas
  - Organics
  - Water (free, interstitial, and hydrated)



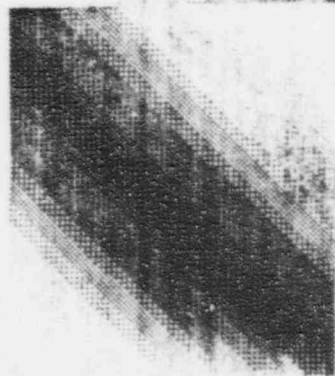
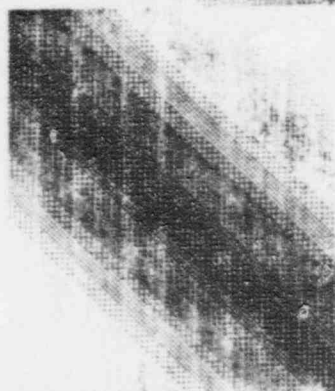
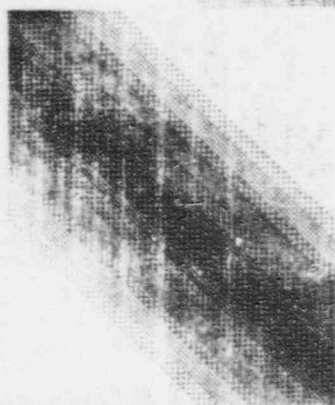


## Debris Processing (cont.)

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### ■ Steam Reformer

- Approximately 4 ft X 6 ft X 7.5 ft
- Generates Syngas to can feed evaporator at 593 degrees C (1100 degrees F) at 1-3 cfm
- Pyrolysis of organic materials at 1200 degrees C (>2000 degrees F)
  - Discharge gases are air with minimal hydrogen, carbon dioxide and steam at 1-5 cfm
  - Discharge gases are HEPA filtered and discharged to plant ventilation at ~ ambient temperature and 2000 cfm



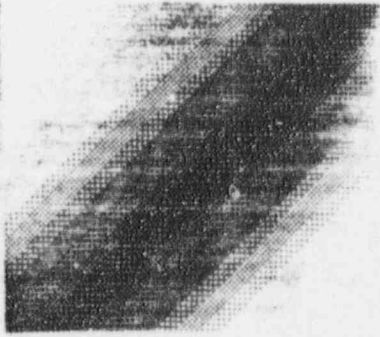


## Debris Processing (cont.)

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- **Post-Steam Reforming Packaging**
  - Capsule loading station
    - Used for shielded transfer of process canisters into process can capsule

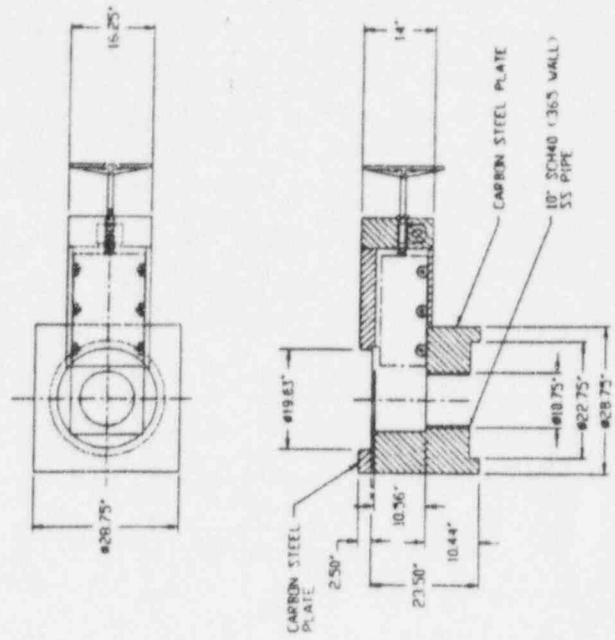




The technical drawing consists of two main parts: a plan view at the top and an elevation view below it.

- Plan View:** Shows a rectangular structure with internal dimensions of 17'-0" and 19'-0". It includes a central circular feature and various alignment lines.
- Elevation View:** Shows the side profile of the structure. Key features include:
  - A horizontal section labeled "SECTION A-A" passing through the center.
  - A vertical dimension of 68'-0" from the base to the top of the main structure.
  - A horizontal dimension of 10'-0" for the width of the main structure.
  - A horizontal dimension of 11'-0" for the width of the abutment.
  - A horizontal dimension of 13'-0" for the width of the approach road.
  - A horizontal dimension of 14'-0" for the width of the approach road.
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  - A horizontal dimension of 28'-0" for the width of the approach road.
  - A horizontal dimension of 29'-0" for the width of the approach road.
  - A horizontal dimension of 30'-0" for the width of the approach road.

CAPSULE LOADING STATION



CAPSULE SHIELDING GATE