





### SAFETY MARGINS AND CONSERVATISMS

- **Only 2% of fuel processed had an initial U-235 enrichment in excess of 5 weight percent.**
- **Only 5% of post-irradiated fuel had a U-235-equivalent enrichment greater than 3 weight percent.**
- **Direct radiation levels and radioactivity concentrations measured during 1986 characterization activities indicate that fuel material in the cell has been irradiated.**
- **NFS documented only one spill of unprocessed fuel in the GPC, which occurred in the first reprocessing campaign. No other fuel spills were reported in subsequent NFS quarterly reports to the AEC.**
- **NFS had an economic incentive to recover spilled fuel.**





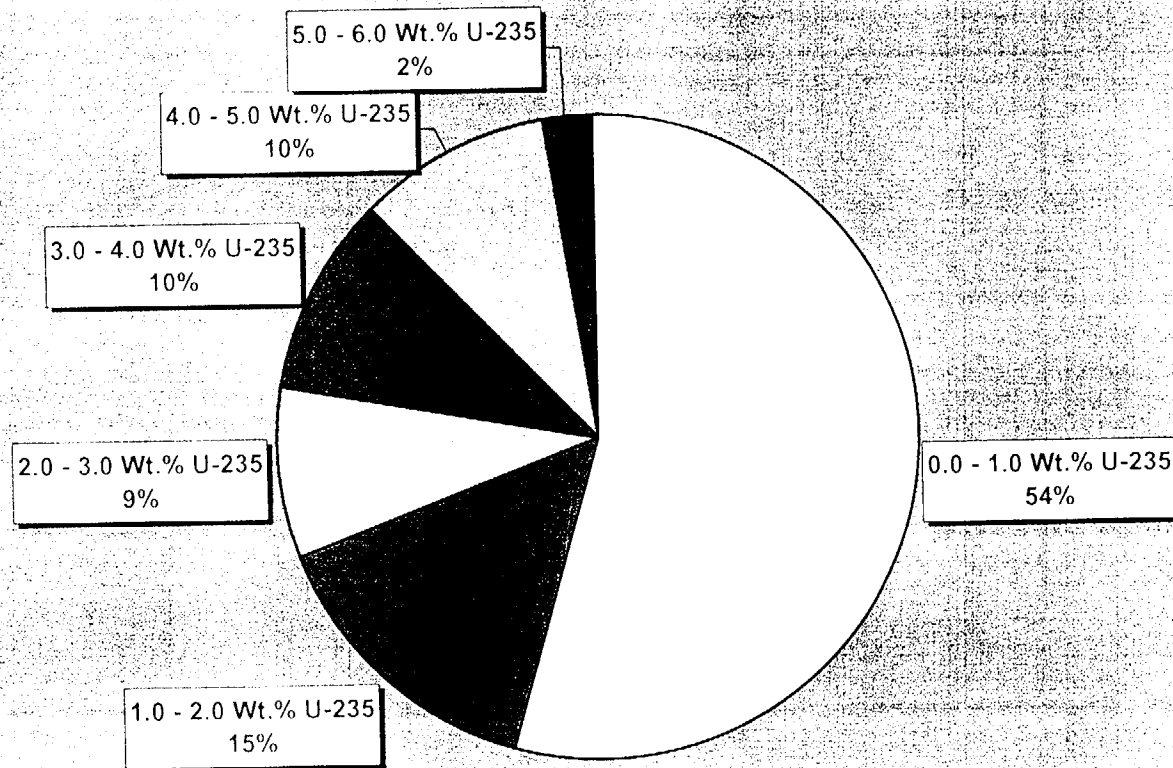
## WVDP PATH-FORWARD

- **WVDP prepares letter to NRC requesting concurrence on path-forward (currently with NRC)**
- **NRC concurs on WVDP path-forward for use of process knowledge to characterize GPC SNM wastes**
- **WVDP prepares criticality safety analysis for decontamination activities using evaluation basis fuel**
- **WVNS incorporates criticality safety analysis into SAR revision**
- **WVNS submits revised SAR to DOE and NRC for review and approval**
- **WVNS begins decontamination activities in GPC following DOE and NRC approvals of revised SAR**





Percent of Fuel by Initial U-235 Enrichment Reprocessed by NFS





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**NRC OPERATING RESTRICTION FOR THE GPC  
WVDP PROPOSED RESOLUTION**

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**“...NRC expects that the complete characterization of material within the GPC and a criticality analysis of all proposed activities within the GPC be completed prior to the onset of ... activities [in the GPC].”**





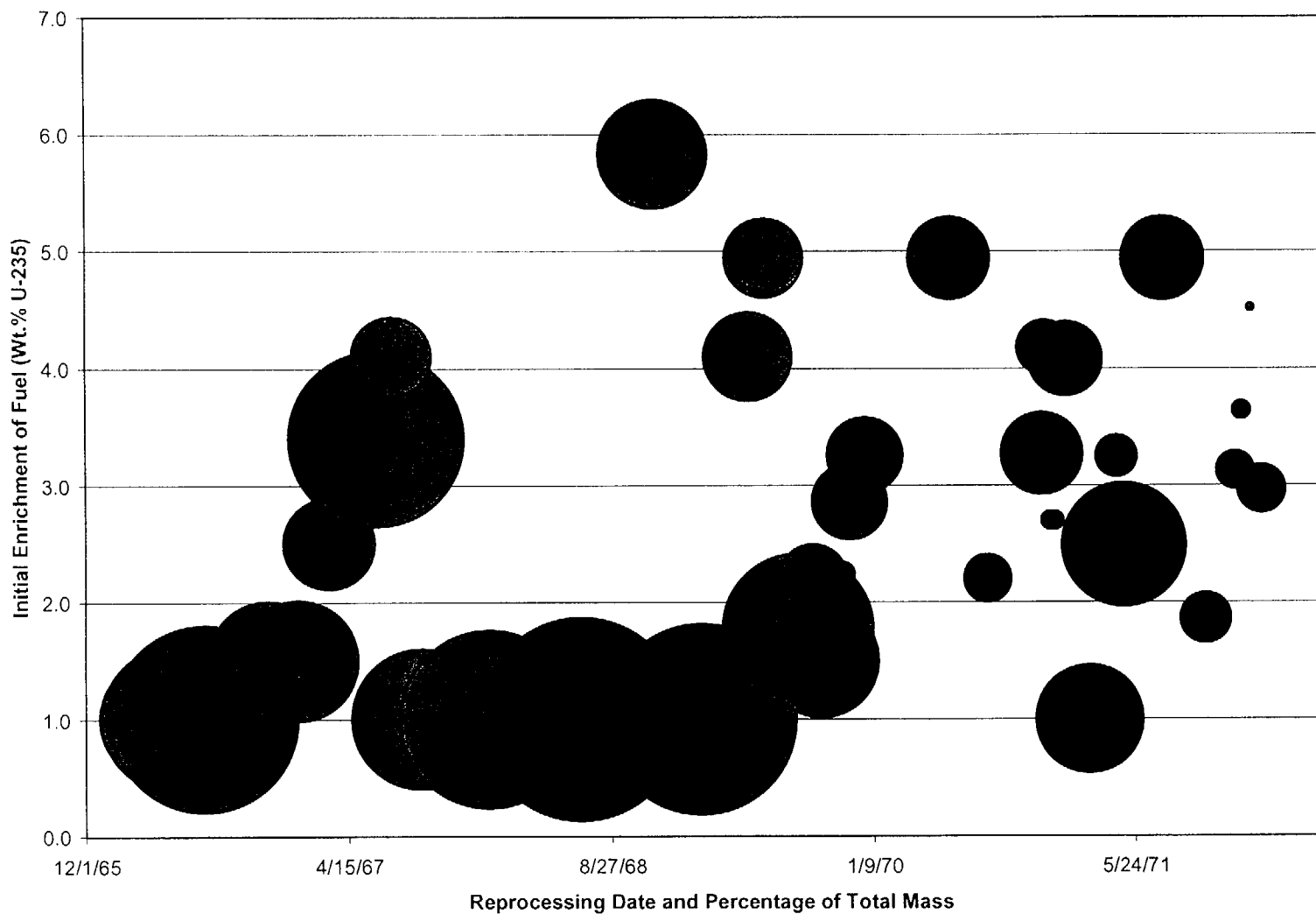
## **HISTORY AND STATUS OF THE GENERAL PURPOSE CELL**

- **Cell used as transfer area between spent fuel mechanical handling cell and chemical dissolution cell**
- **Video inspections indicate presence of water in cell**
- **Inspection unable to verify whether hull sections contain fuel**
- **Cell contains significant amount of debris in sump area**





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## HISTORY OF ISSUE

- 07/91** DOE-ID Nuclear Safety Inspection of the WVDP results in the observation that no documentation can be provided to justify why the GPC is not provided with a criticality alarm system.
- 09/93** Westinghouse Hanford Corporation (WHC) performs a highly conservative analysis of an assumed fuel configuration in the GPC and concludes that the credible potential for a criticality exists in the GPC.
- 10/93** WVDP analysts conclude that original WHC analysis is based on excessive conservatisms and requests re-analysis of cell conditions.
- 01/96** WVNS documents results of WHC analysis in upgrade of WVNS-SAR-002, "Safety Analysis Report for Low-Level Waste Processing and Support Activities." SAR is subsequently reviewed and approved by NRC with operational restriction included in SER.
- 09/96** Subsequent analysis by WHC concludes that criticality in GPC is not possible.
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## THE RESTRICTION AND SUBSEQUENT COMMITMENTS

- **NRC indicates in their Safety Evaluation Report for WVNS-SAR-002 (DW:95:0896) that the “...NRC expects that the complete characterization of material within the GPC and a criticality analysis of all proposed activities within the GPC be completed prior to the onset of ... activities [in the GPC].”**
- **OH/WVDP endorses this position in their subsequent Safety Evaluation Report for WVNS-SAR-002 (DW:95:1023): “The WVDP has committed to evaluate the GPC criticality potential before movement of any special nuclear material (SNM) in the cell.”**





## PRESENTATION OBJECTIVES

- **Inform the NRC on the WVDP path-forward for removal of the GPC operating restriction**
  - **Use of process knowledge for criticality analyses**
  - **Use of evaluation basis fuel for criticality calculations**





## SELECTED METHODOLOGY

- **Use process knowledge to define an evaluation basis fuel**
- **Evaluation basis fuel characteristics:**
  - **unirradiated**
  - **5 weight percent U-235 enrichment**





## JUSTIFICATION FOR SELECTED METHODOLOGY

### PROCESS KNOWLEDGE

- **AEC requirements for reactor fuel data provides high level of confidence in initial assembly characteristics**
- **Use of approved burn-up codes, reactor power history, and shipping manifests provide confidence in what was received on site**
- **NFS processing records provide confidence in what was processed**
- **NFS Quarterly Reports provide documentation of upsets in cell**

### SAMPLING AND ANALYSIS

- **Sampling would require assumptions regarding representativeness that would be difficult to justify**
- **Handling of samples and analyses has associated hazards and exposures**

