

## Attachment 7



# *Small Diameter and Non-Standard Overlays*

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## ***Why do we need them?***

- ▼ **BWRVIP has recently issued a document (BWRVIP-27A)**
- ▼ **This document recommends volumetric examination of many of the Standby Liquid Control lines (SLC) in BWRS**
- ▼ **These welds are small diameter < 4.0" dissimilar metal welds usually joined with inconel weld material**
- ▼ **These lines cannot be isolated so weld overlay repair is the most likely repair process**
- ▼ **PDI procedures do not cover diameters less than 4.0"**



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## *Why do we need them?*

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### ▼ Possible PWR need also

- MRP guidelines may require examination of small diameter < 4.0" inconel welds that may also require repair
- MRP is considering application of preventive overlays as a solution to inspection and materials problems



## **Status**

### **▼ BWR work**

- Reviewed survey/configuration data gathered by BWRVIP to determine how many configurations exist
- Designs selected
- Designs to be reviewed by Structural Integrity to assure all possible scenarios are addressed
- Get firm cost estimate
- Fabricate
- Fingerprint and put into program

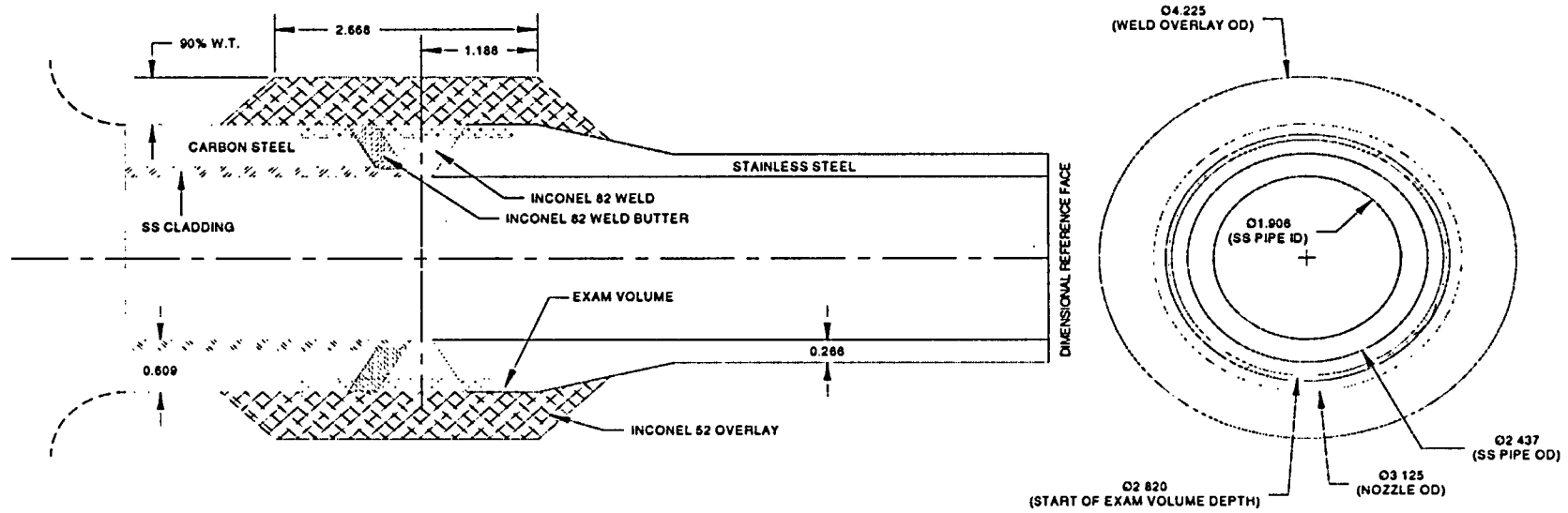
### **▼ Procedure and Personnel qualifications will have to be expanded**

### **▼ 60K Samples (Funded by BWRVIP)**

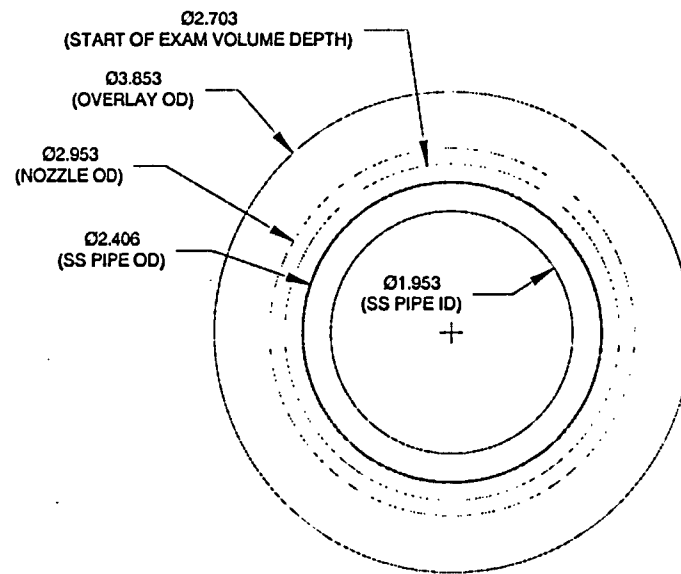
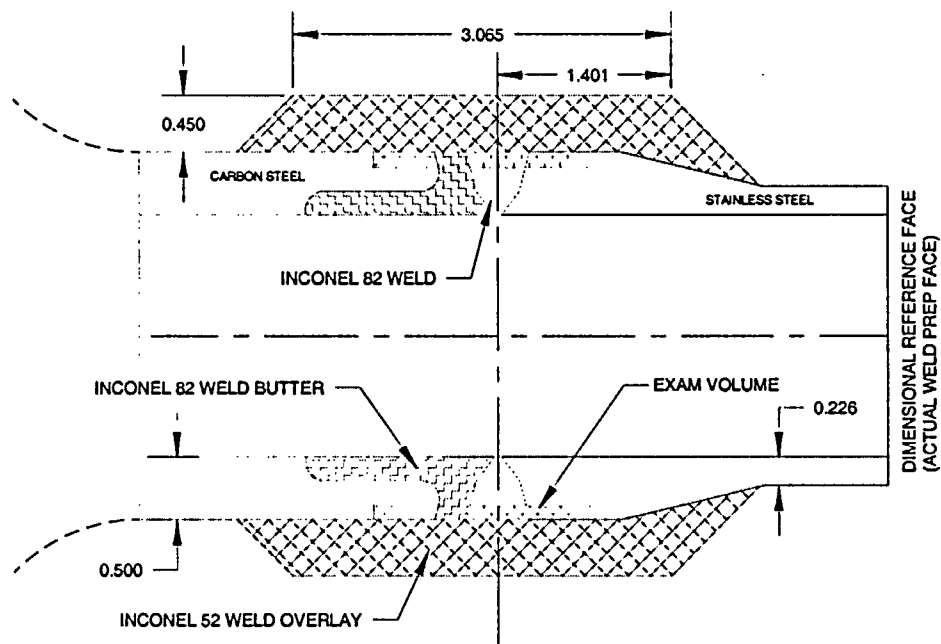
### **▼ Samples could be delivered by July 04 and available for qualification work by August 04**

- Could support fall outage needs if required

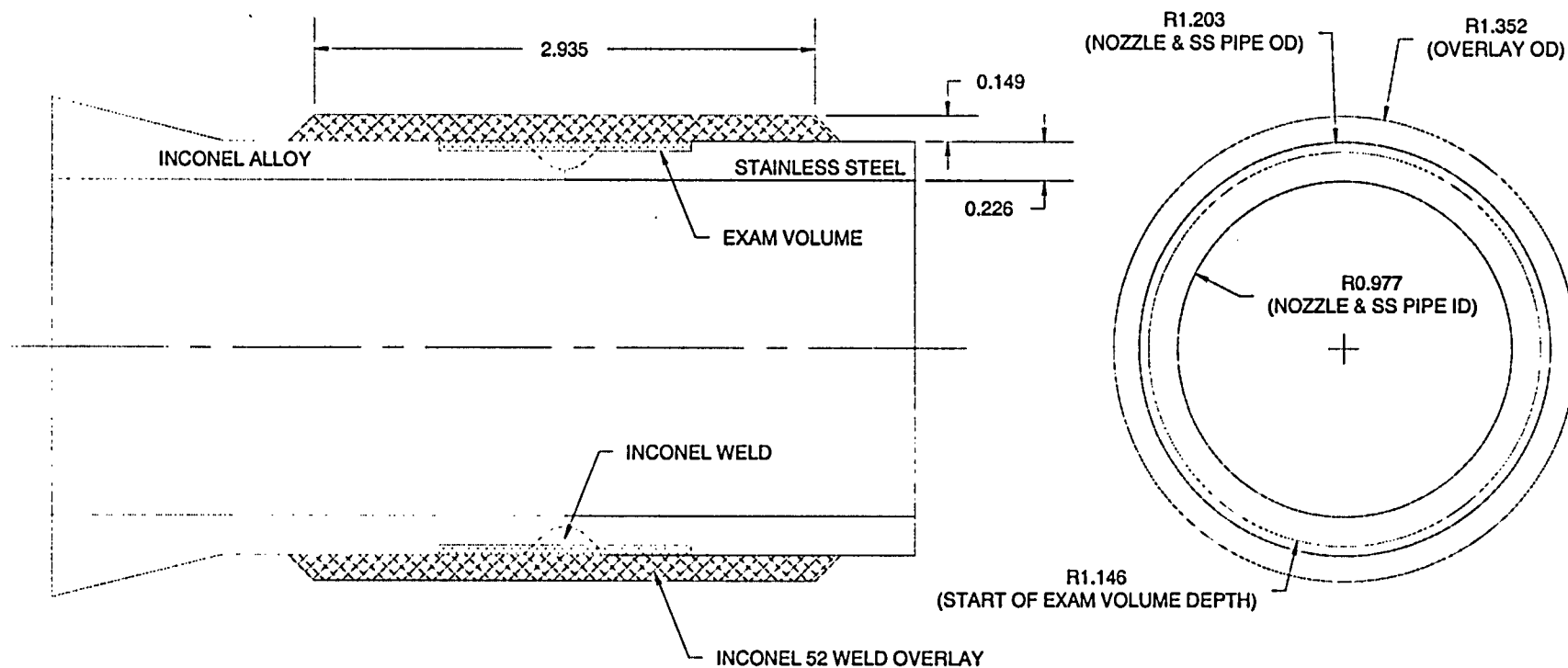
## BROWNS FERRY DESIGN BASE 2" SAMPLE



**DUANE ARNOLD DESIGN BASE 2" SAMPLE**

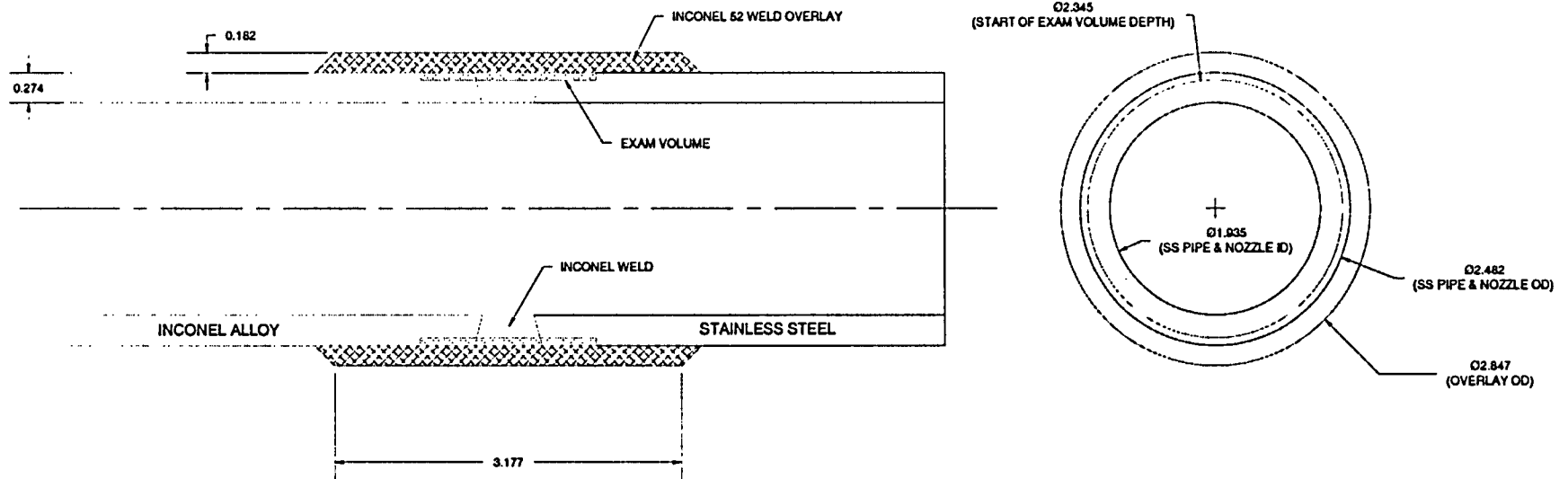


## LIMERICK DESIGN BASE 2" SAMPLE



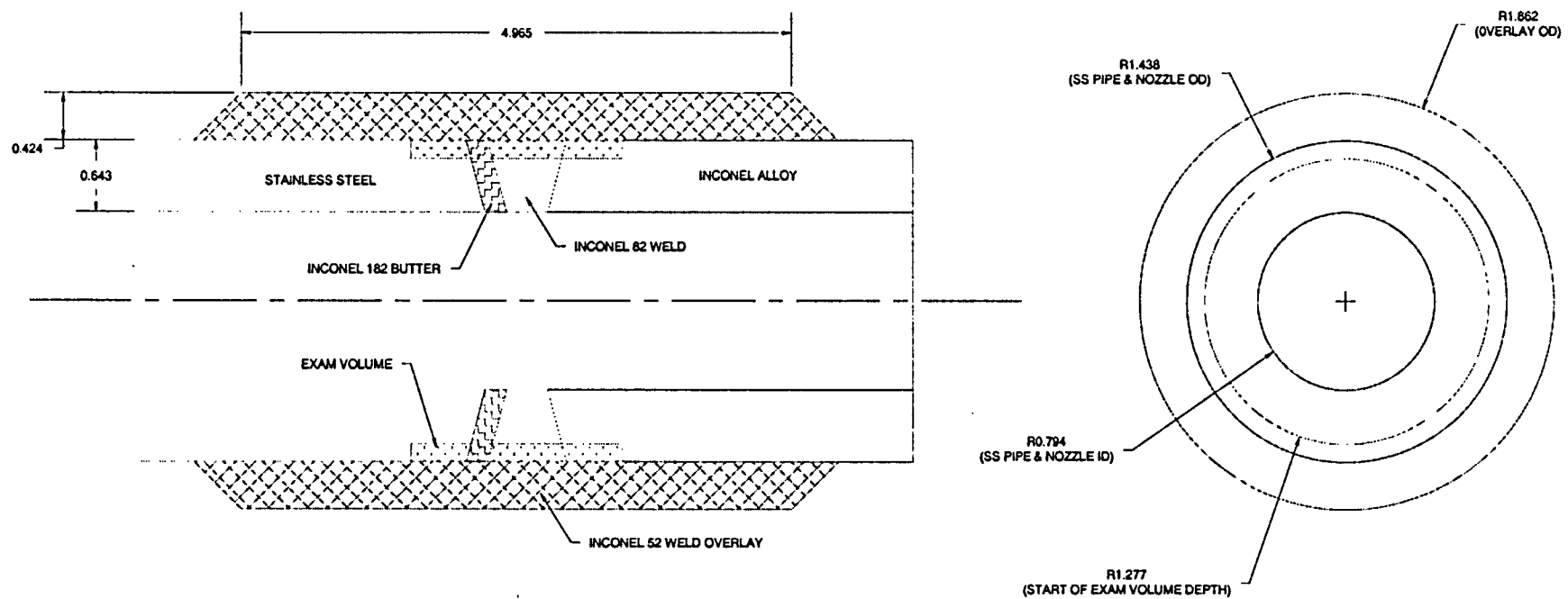


## HATCH DESIGN BASE 2" SAMPLE

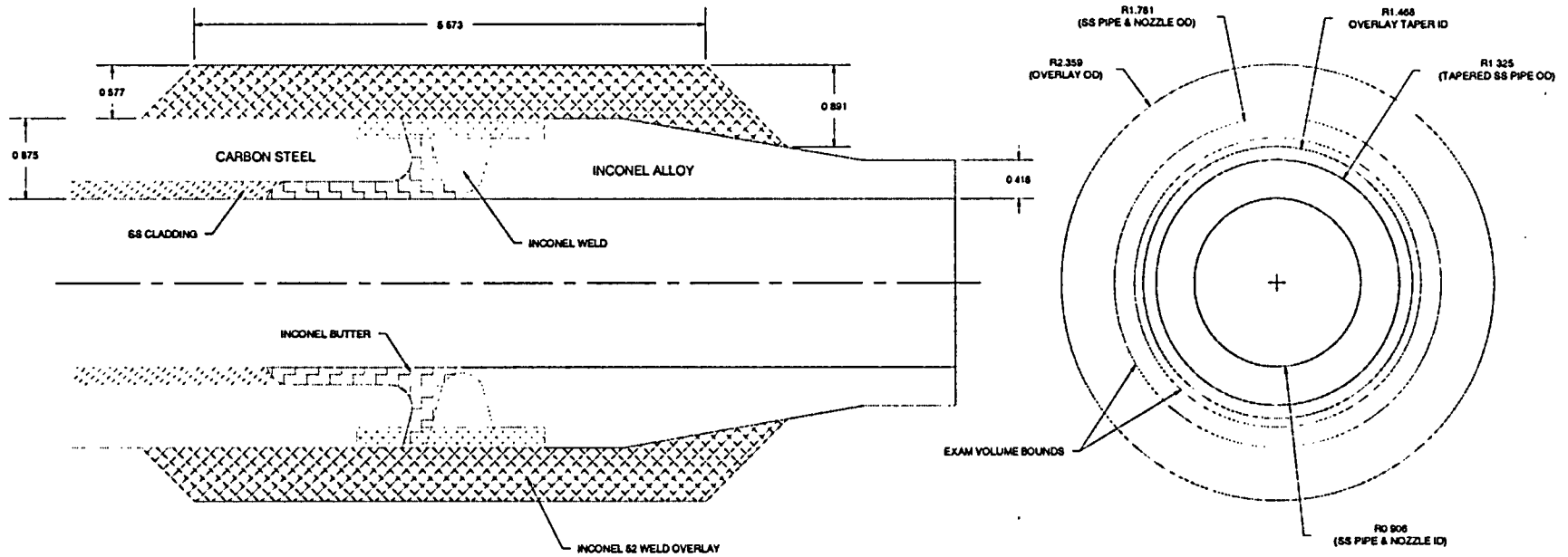




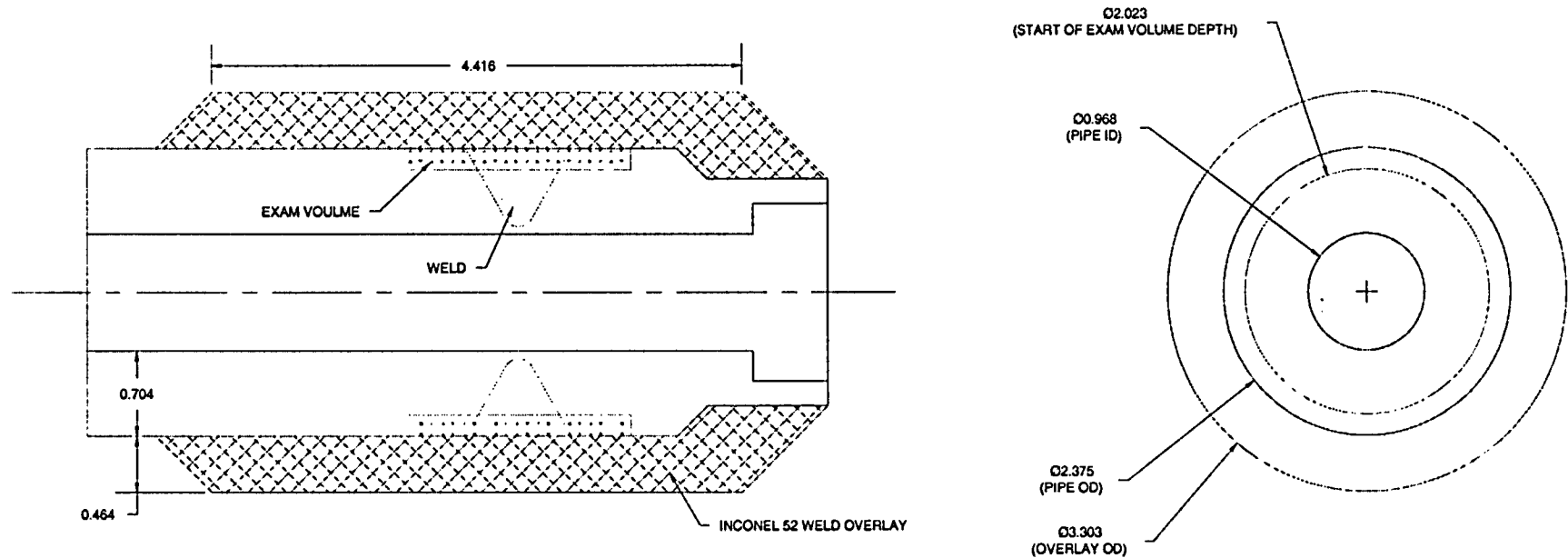
# FERMI DESIGN BASE 2" SAMPLE



## BRUNSWICK DESIGN BASE 2" SAMPLE



## CLINTON DESIGN BASE 2" SAMPLE





## Status

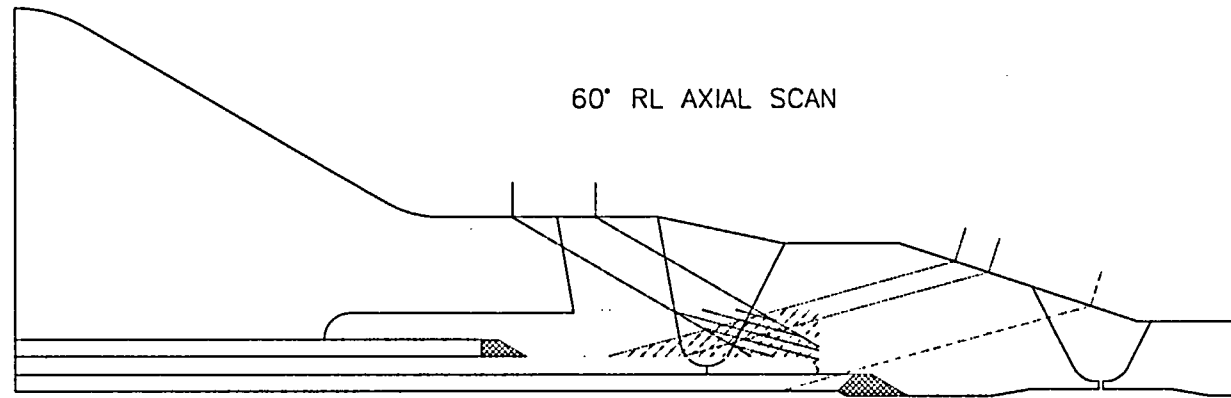
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### ▼ PWR Work

- Safety, Spray and Relief Nozzles
  - EPRI staff has been working with Exelon, WESDYNE and Westinghouse personnel in the design of a preventive overlay for all Westinghouse Spray, Safety and Relief Nozzles
  - One sample is being fabricated that is designed to cover all configurations
    - *Owned by PDI*
    - *Available to all vendors/utilities*
  - Will require a revision to previously qualified procedures to address tapered surfaces
  - Procedure qualification only (No Personnel qualifications)

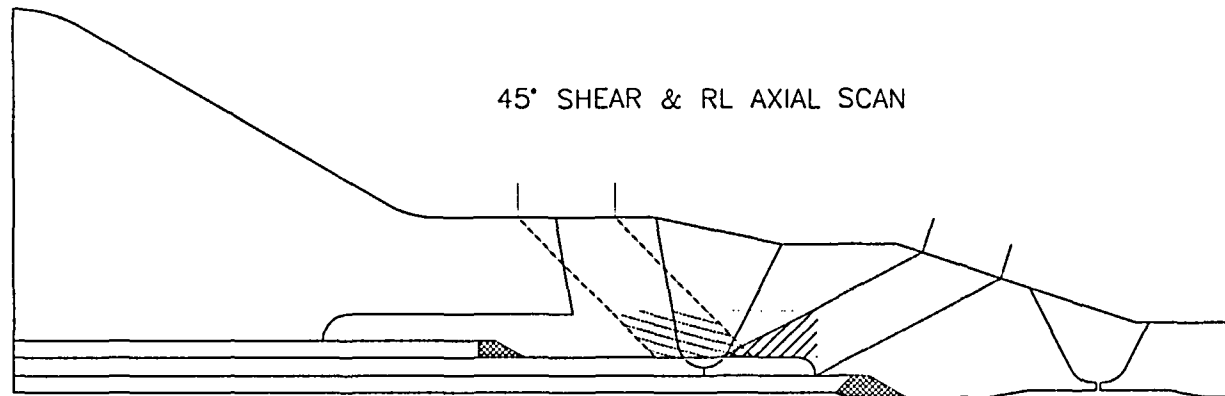


# Achievable Coverage



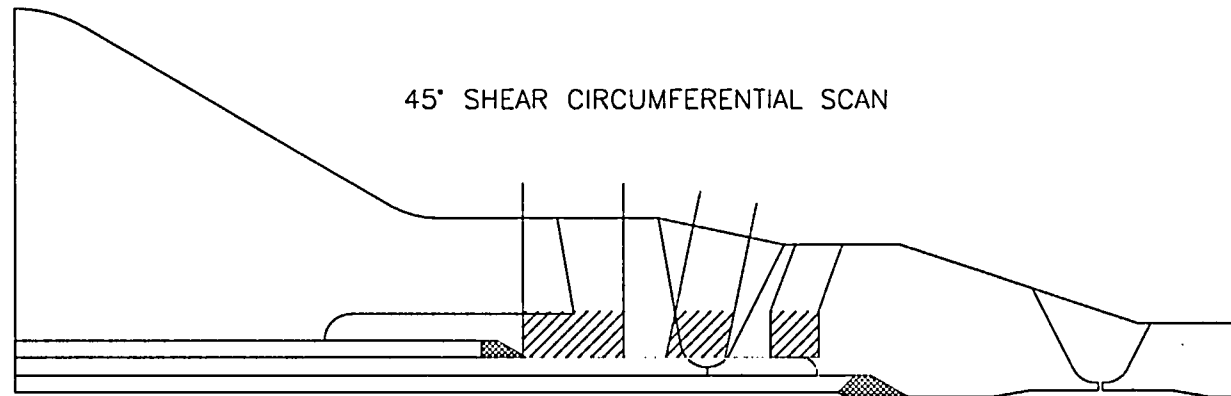


# Achievable Coverage





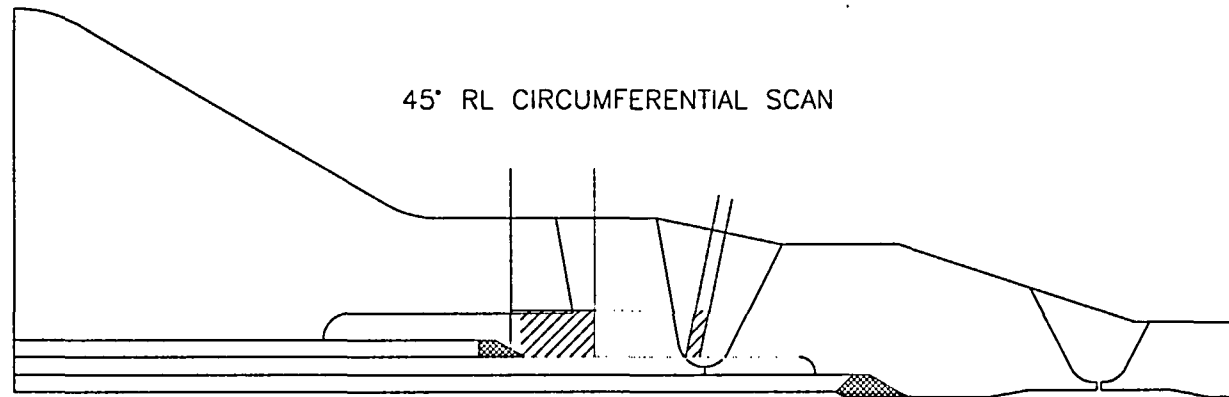
# Achievable Coverage







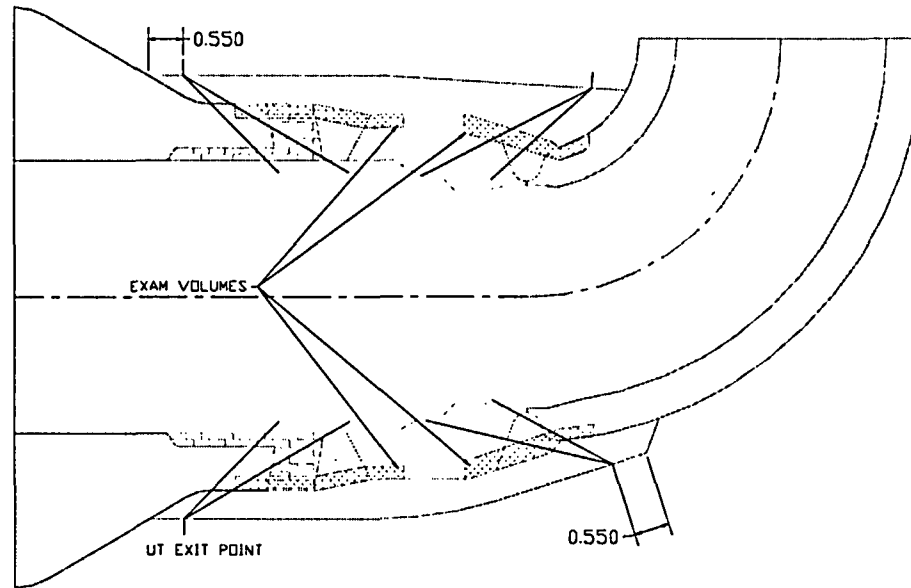
# Achievable Coverage





# PDI Sample Being Fabricated

45° & 60° UT COVERAGE WITH OVERLAY





## **Status**

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### **▼ PWR Work**

- Small diameter DM weld overlays
  - Calvert Cliffs has paid to expedite the fabrication of 2 small diameter overlays to cover some of the CE configurations
  - They are very similar to the SLC lines in the BWR's and will be included in the PDI test set



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## ***Summary***

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- ▼ **Overlays may be best solution to address configurations that cannot be examined with qualified techniques**
- ▼ **EPRI/PDI working with other industry groups to assure qualified procedures and personnel are available to address non-standard overlay applications**