



# Feeder Thinning

At The Point Lepreau NGS

18 Dec 1997

New Brunswick Power

# What Role Do Feeders Play?

- Reactor Assembly
- Heat Transport System Schematic
- Typical Feeder Configuration

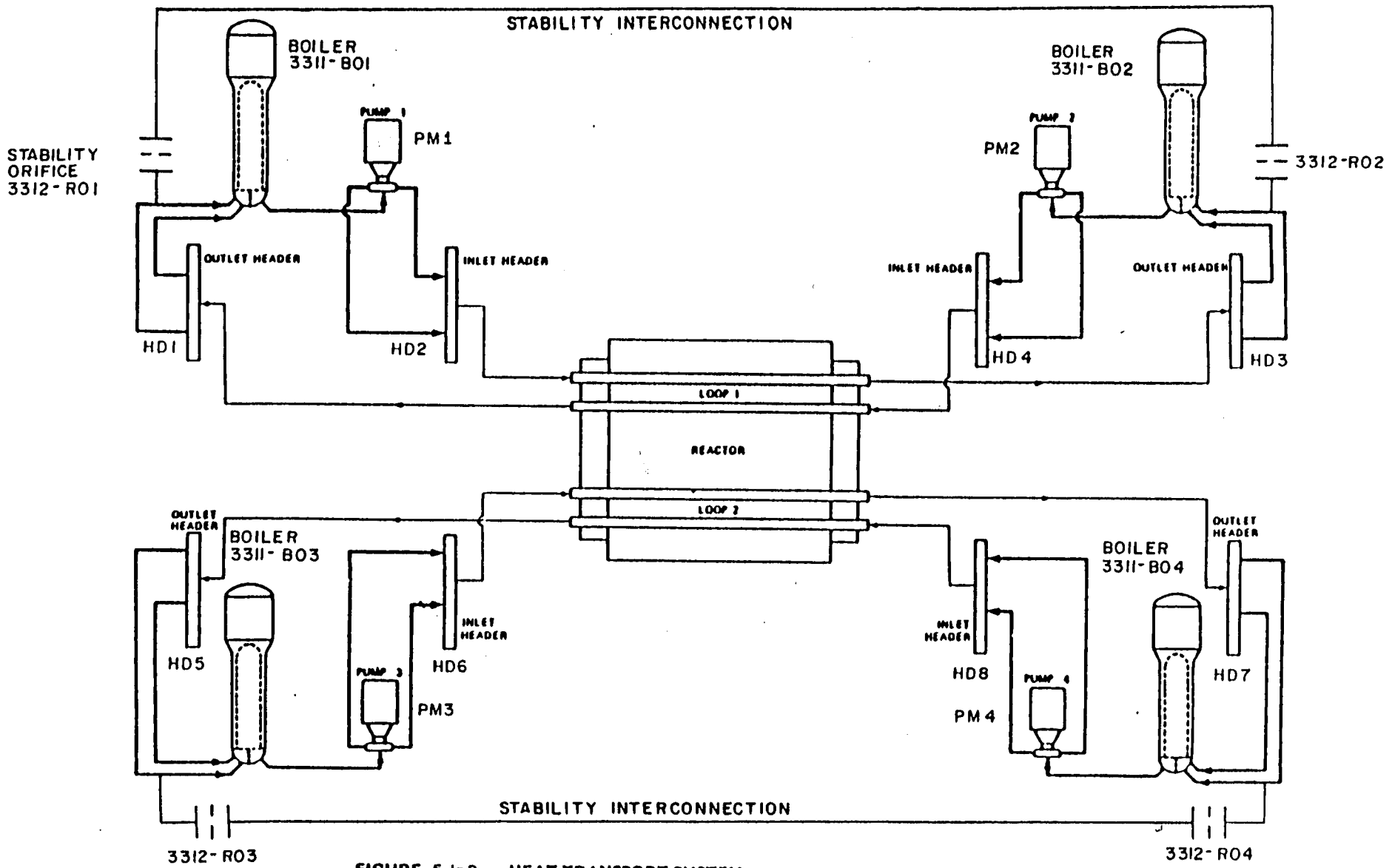
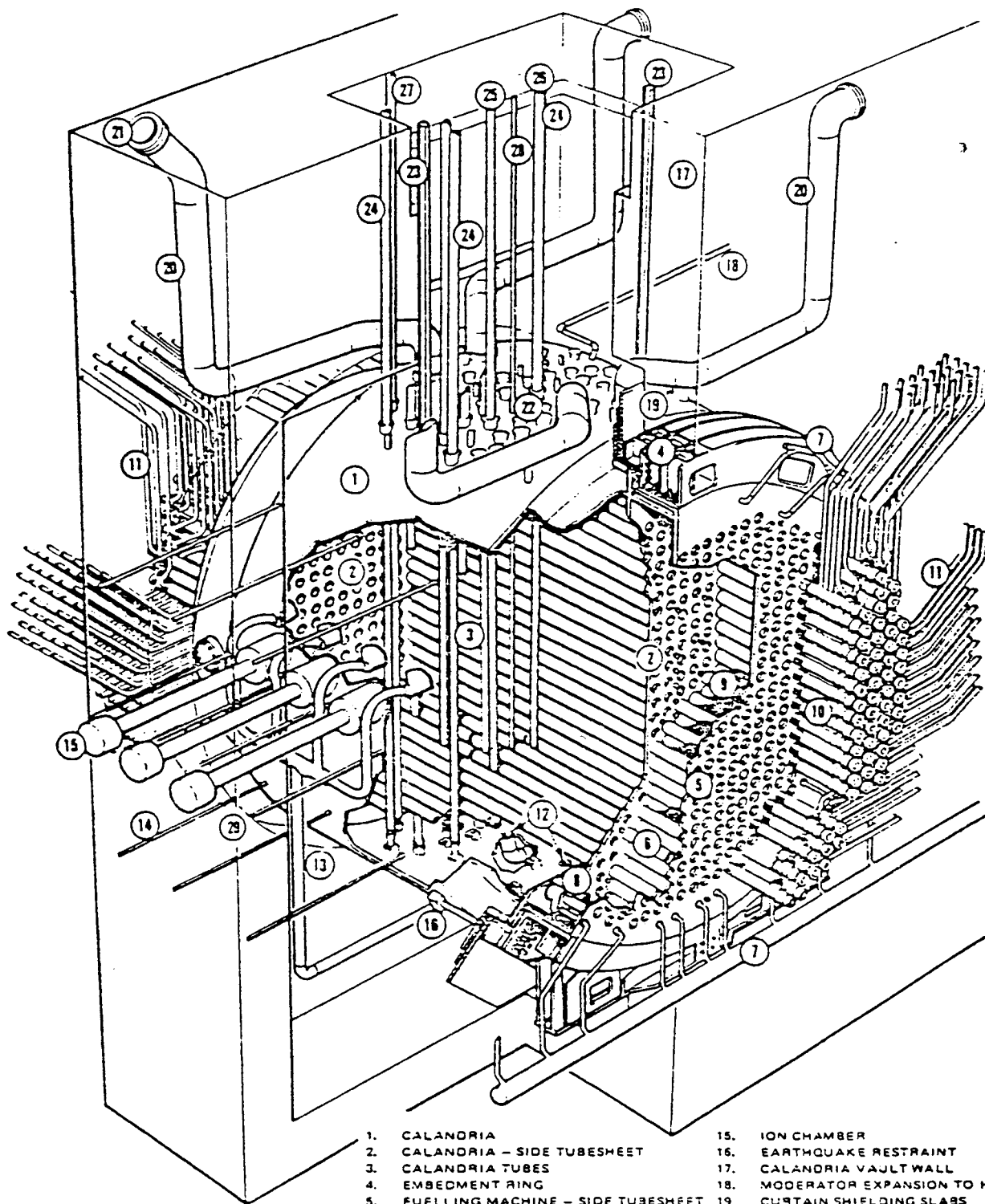


FIGURE 5.1-2 HEAT TRANSPORT SYSTEM - SCHEMATIC



- |     |                                   |     |                                  |
|-----|-----------------------------------|-----|----------------------------------|
| 1.  | CALANDRIA                         | 15. | ION CHAMBER                      |
| 2.  | CALANDRIA - SIDE TUBESHEET        | 16. | EARTHQUAKE RESTRAINT             |
| 3.  | CALANDRIA TUBES                   | 17. | CALANDRIA VAULT WALL             |
| 4.  | EMBEDMENT RING                    | 18. | MODERATOR EXPANSION TO HEAD TANK |
| 5.  | FUELLING MACHINE - SIDE TUBESHEET | 19. | CURTAIN SHIELDING SLABS          |
| 6.  | END SHIELD LATTICE TUBES          | 20. | PRESSURE RELIEF PIPES            |
| 7.  | END SHIELD COOLING PIPES          | 21. | RUPTURE DISC                     |
| 8.  | INLET-OUTLET STRAINER             | 22. | REACTIVITY CONTROL UNIT NOZZLES  |
| 9.  | STEEL BALL SHIELDING              | 23. | VIEWING PORT                     |
| 10. | END FITTINGS                      | 24. | SHUTOFF UNIT                     |
| 11. | FEEDER PIPES                      | 25. | ADJUSTER UNIT                    |
| 12. | MODERATOR OUTLET                  | 26. | CONTROL ABSORBER UNIT            |
| 13. | MODERATOR INLET                   | 27. | ZONE CONTROL UNIT                |
| 14. | HORIZONTAL FLUX DETECTOR UNIT     | 28. | VERTICAL FLUX DETECTOR UNIT      |
|     |                                   | 29. | LIQUID INJECTION SHUTDOWN NOZZLE |



# Carbon Steel Corrosion Mechanisms

- Apparent Average Corrosion Rates
  - AECL Predictions
  - Effect Of Flow Velocity
- Carbon Steel Corroding Under FAC Conditions

11. FIGURES

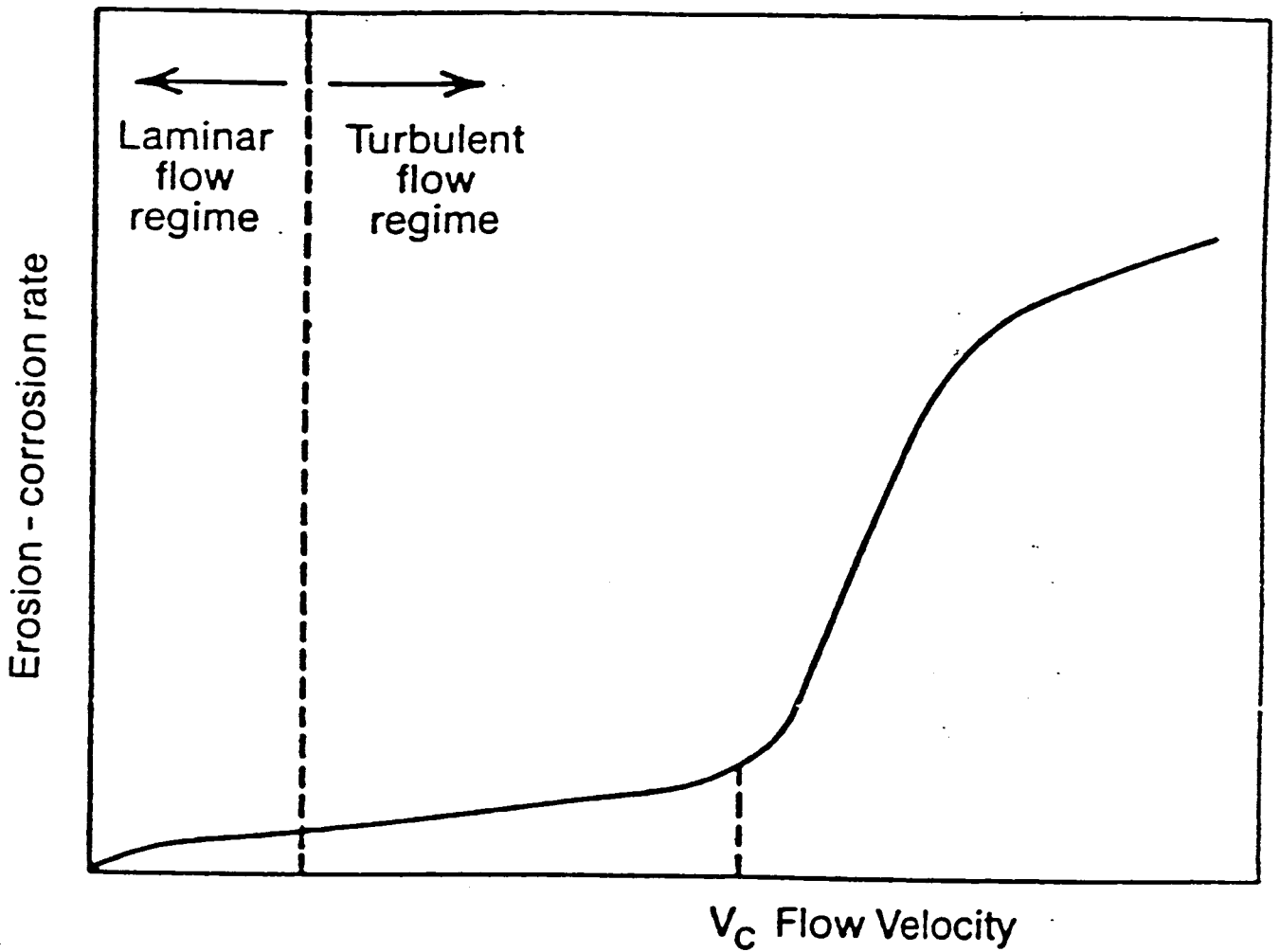


Figure 1 Schematic Showing the Effect of Flow Velocity on Erosion - Corrosion Rate (from Ref. 1).

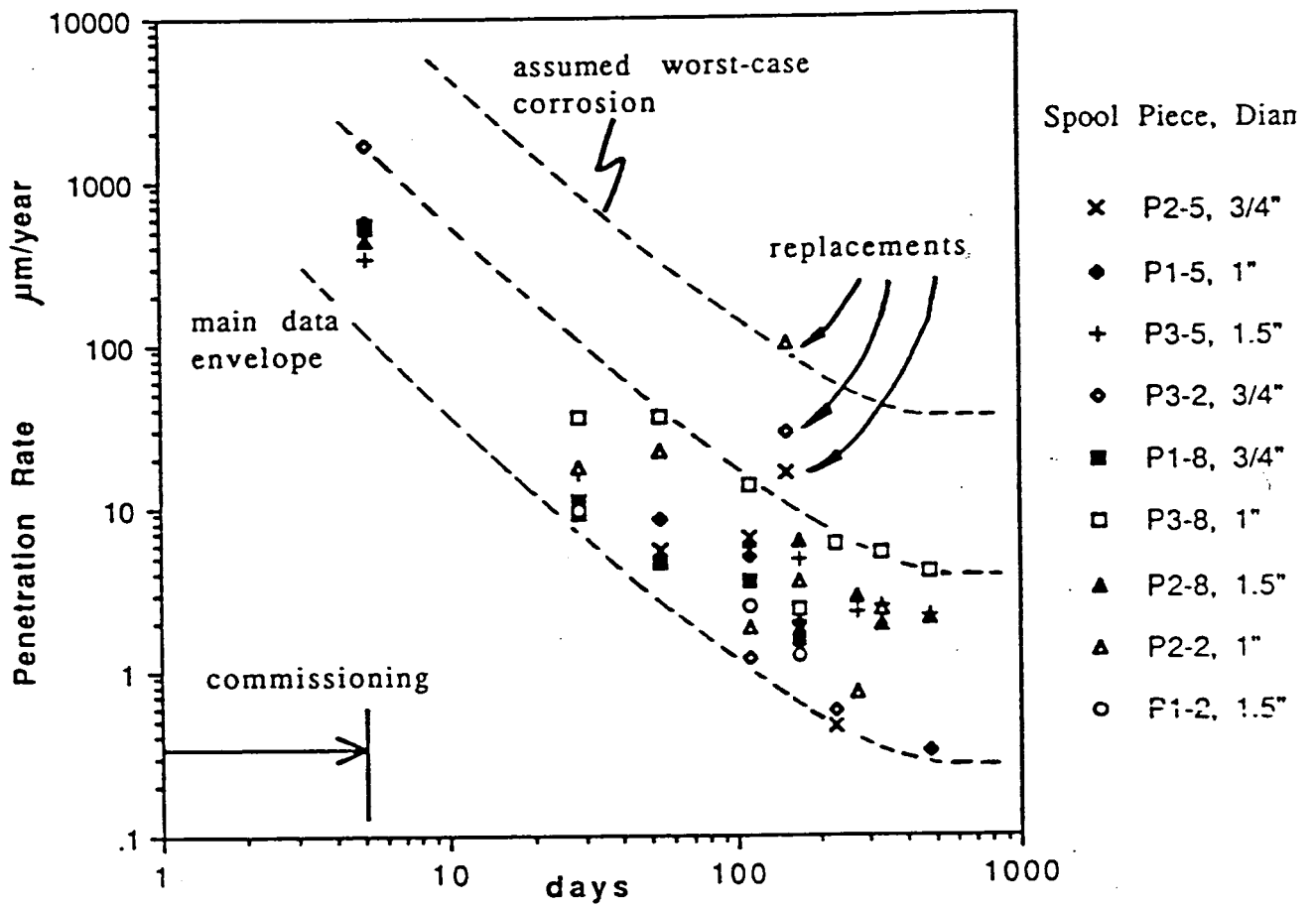


Figure 17 Apparent Average Corrosion Rates of SPEL Spool Pieces Vs Time



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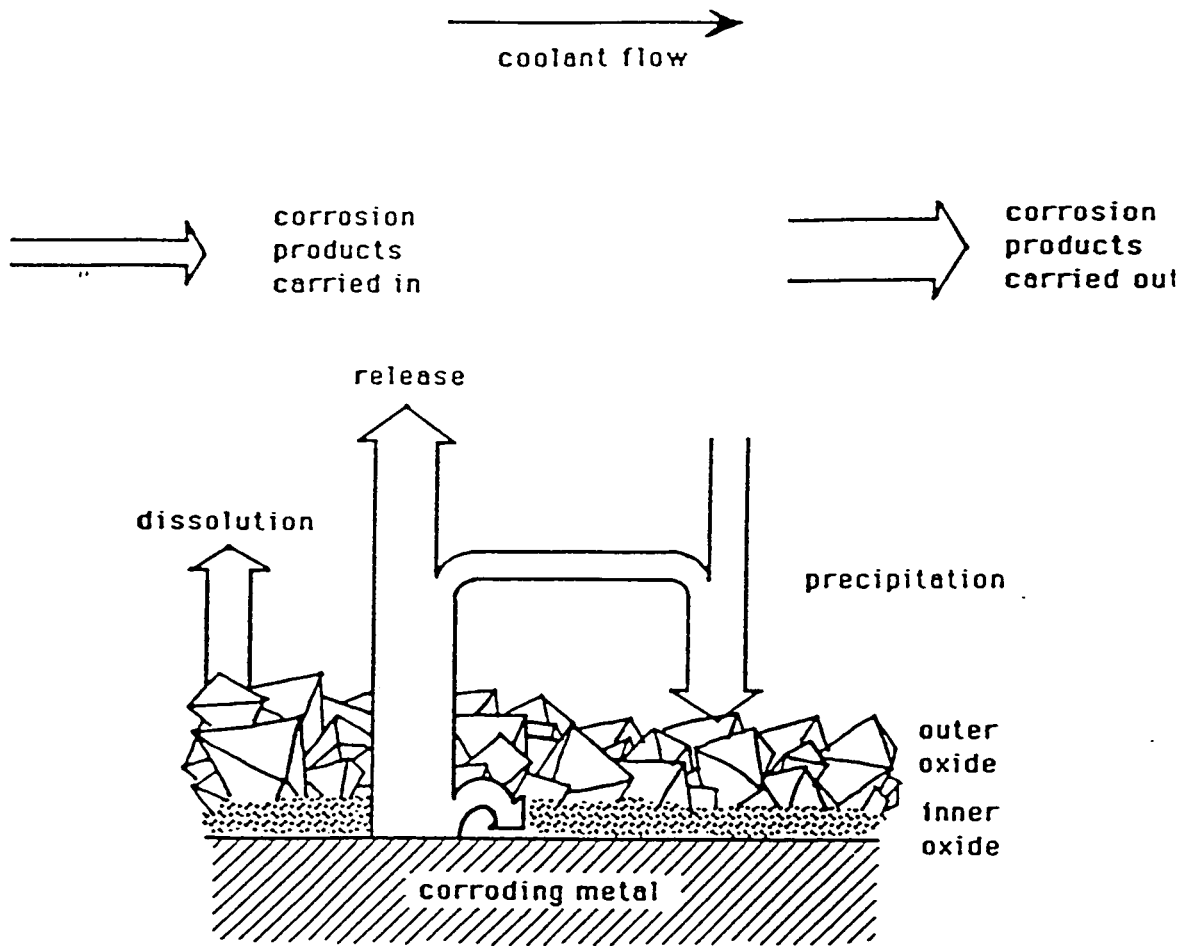
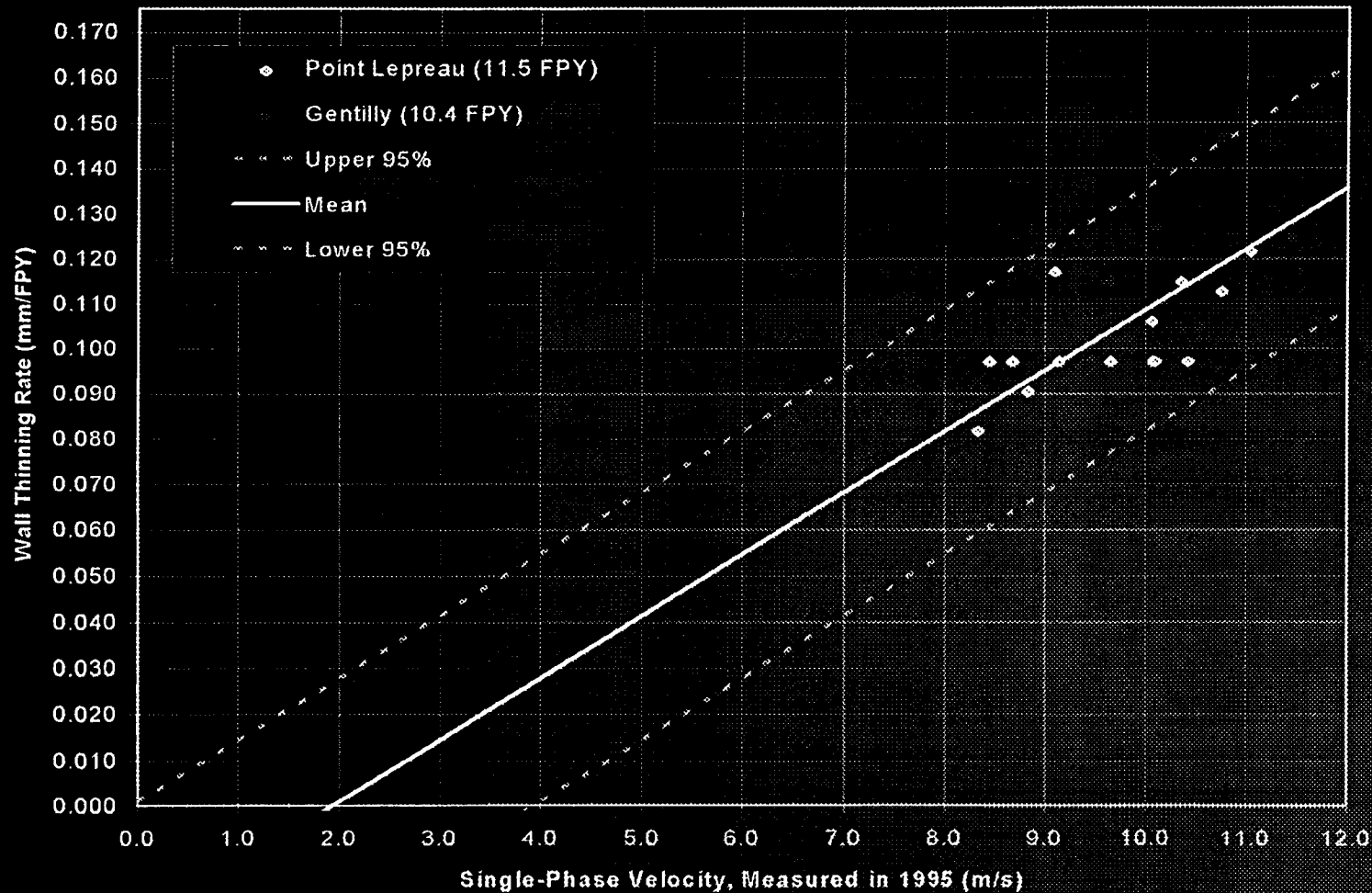


Figure 2 Carbon Steel Corroding Under FAC Conditions.

# Outlet Feeder Wall Thinning



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**POINT LEPREAU OUTLET FEEDER WALL THICKNESS  
STATUS REPORT - FALL '97 OUTAGE**

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Full Power Years at Shutdown:	13.03 FPY
Number of Feeders Measured this Outage, Baseline:	79 of 175
Number of Feeders Measured this Outage, Repeat:	6 of 7
Total Number Measured, Including Previous Years:	145 of 380

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Minimum Measured Thickness for 2" Feeders, Fall '97:	3.53 mm
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*(Minimum Allowable Thickness is 2.69 mm, the Minimum Measured in 1996 was 3.44 mm)*

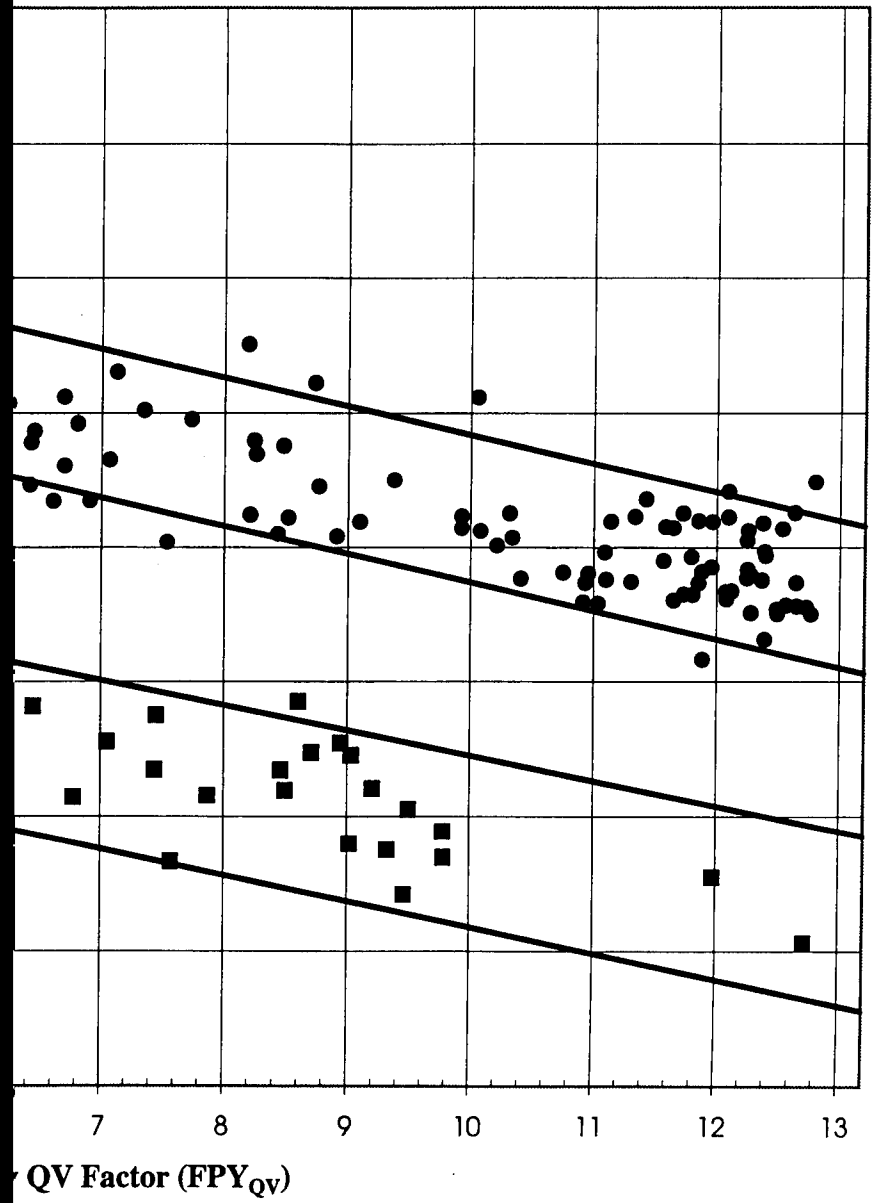
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Minimum Measured Thickness for 2.5" Feeders, Fall '97:	4.58 mm
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*(Minimum Allowable Thickness is 3.25 mm, the Minimum Measured in 1996 was 4.71 mm)*

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# Measured Thickness with QV Model



**Figure 3: Distribution for Feeder Inspection/Maintenance to Demonstrate Fitness-For-Service for each Pipe Size**

