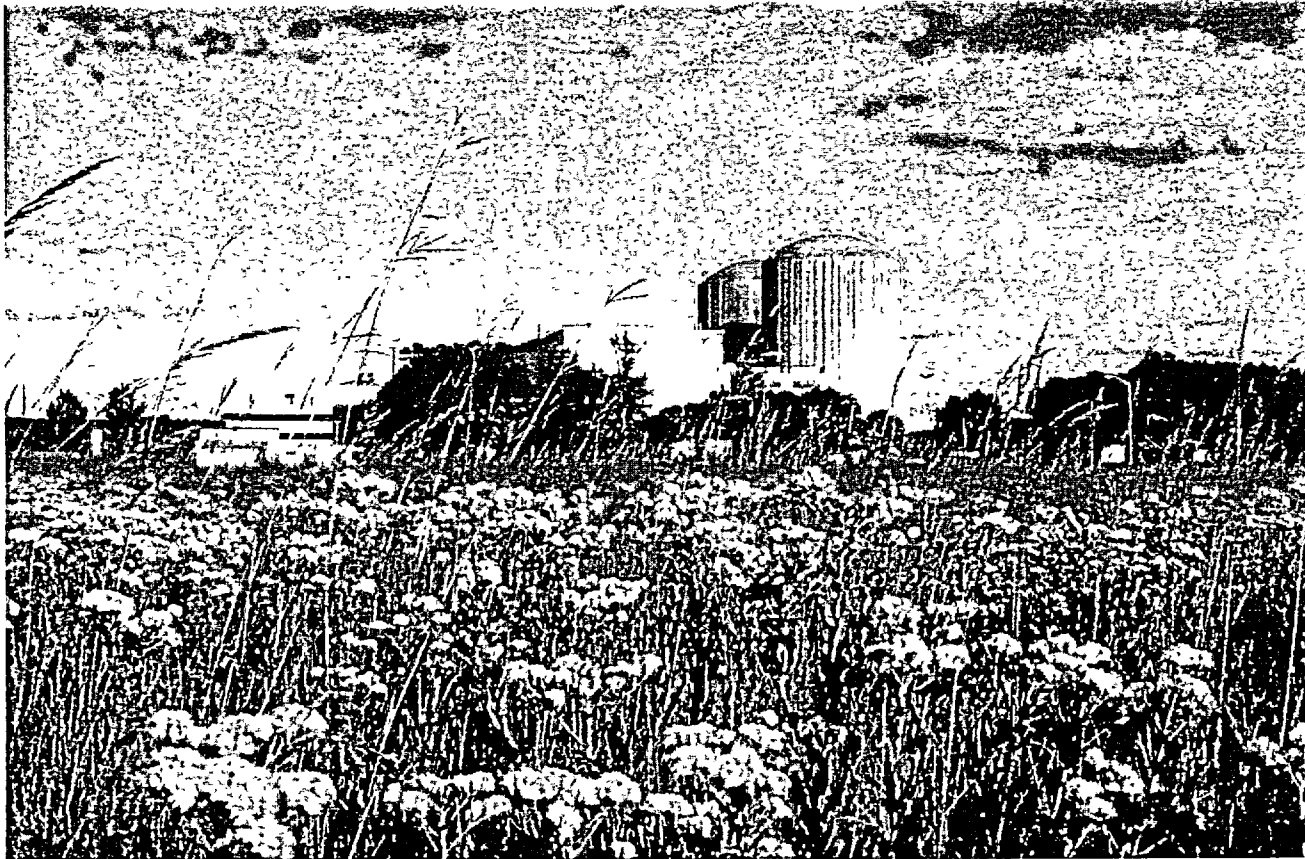
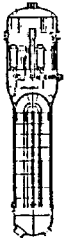




PINGP Unit 1 Steam Generator Replacement Project



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SGR Project Update Attendees

- **Nuclear Management Company**

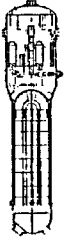
Ken Albrecht – Project Manager

Richard Pearson – Project Engineer, Design

- **Framatome ANP**

Alain Laux – Project Manager

Jean Paul Billoue – Technical Manager

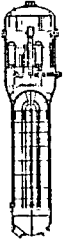


SGR Project Update Meeting Agenda

Project Overview	Ken Albrecht Project Manager
Fabrication	Richard Pearson Project Engineer, Design
Engineering	Richard Pearson
Oversight	Ken Albrecht
Schedule	Ken Albrecht

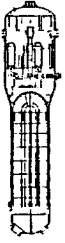
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SGR Project Overview

- Justification for Replacement
- Project Participants
- Project Milestone Schedule



Justification for Replacement

Economic - No Safety Concerns:

- Increasing repair costs
- Potential need for planned mid-cycle inspections, forced outages
- Increasing outage time
- Reduction in plant output
- Replacement energy costs



SGR Project Participants



Project Management - NMC

Nuclear Management Company

- Project management & oversight personnel

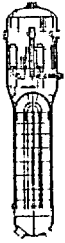
RSG Engineering & Fabrication - FRAMATOME

Framatome ANP SAS

- Engr & Licensing support – Framatome ANP
- Major forgings – Japan Steel Works
- Tubing – SANDVIK Steel

Installation Contractor - SGT

The Steam Generating Team (SGT, Ltd.)



SGR Project Milestone Schedule

September 2004

Tubing Installation Complete

7/03

Fabrication Complete

2/04



RSGs Delivered to PI

5/04

2/03 **Begin Tubing Installation**

SGRO

2003

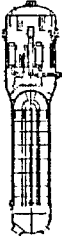
2004

Temp. Facilities Established

Mobilize SGT Resources

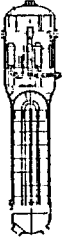
9/03 LARs Submitted

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SGR Project Fabrication

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SGR Project RSG Design

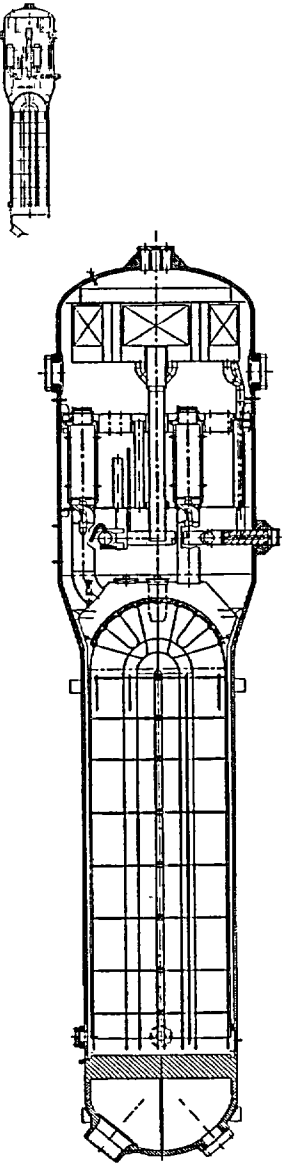
- Framatome Model 56/19
- Two Piece Design
- ASME Section III Vessel
- Compatible – No Major Modifications



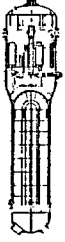
SGR Project RSG Design Philosophy

- Improved tubing material. Alloy 690 (TT) vs. 600 (MA)
- Maximize the heat transfer surface area
- Maintain guaranteed steam pressure of 750 psig with 10% plugging at maximum fouling conditions & normal power levels
- Replacement under 10 CFR 50.59

56/19 Design Features



- 2 piece ASME Section III Class 1 Nuclear Pressure Vessel – to be N-stamped in field
- Alloy 690 (TT) tubing material
- Steam outlet nozzle flow restrictor integral to RSG elliptical head
- Anti-stratification device in feedwater ring to reduce thermal stratification effects
- SS Feedwater Ring with J-tube outlet nozzles and welded inlet thermal sleeve
- SS Quatrefoil Tube Support Plates



OSG/RSG Comparison



	OSG	RSG
Thermal Output (MWt)	825	825
Thot/Tcold/Tave (nom.) (deg F)	590/530/560	590/530/560
Number of Tubes	3388	4868
Tubing OD/WT (in.)	0.875/0.050	0.75/0.043
Heat Transfer Area (sq. ft.)	51,500	61,281
Performance Coefficient UA (10E6 Btu/hr-F)	67.52	81.93
RCS Flow - Best Estimate (10E6 lbm/hr)	38.39	38.51
RCS Pressure (psia)	2250	2250
Steam Flow (10E6 lbm/hr)	3.54	3.57
Full Load Steam Outlet Pressure (design normal operating) (psia)	750	806.8
Max. Moisture Carryover (%)	0.25	0.1
Operating Weight (lbf)	801,073	802,055
Primary Volume (cu ft)	1089	1127
Secondary Liquid Mass (lbm)		
Hot Zero Power	157,123	159,100
100% Power	107,420	107,100



SGR Project Fabrication Status

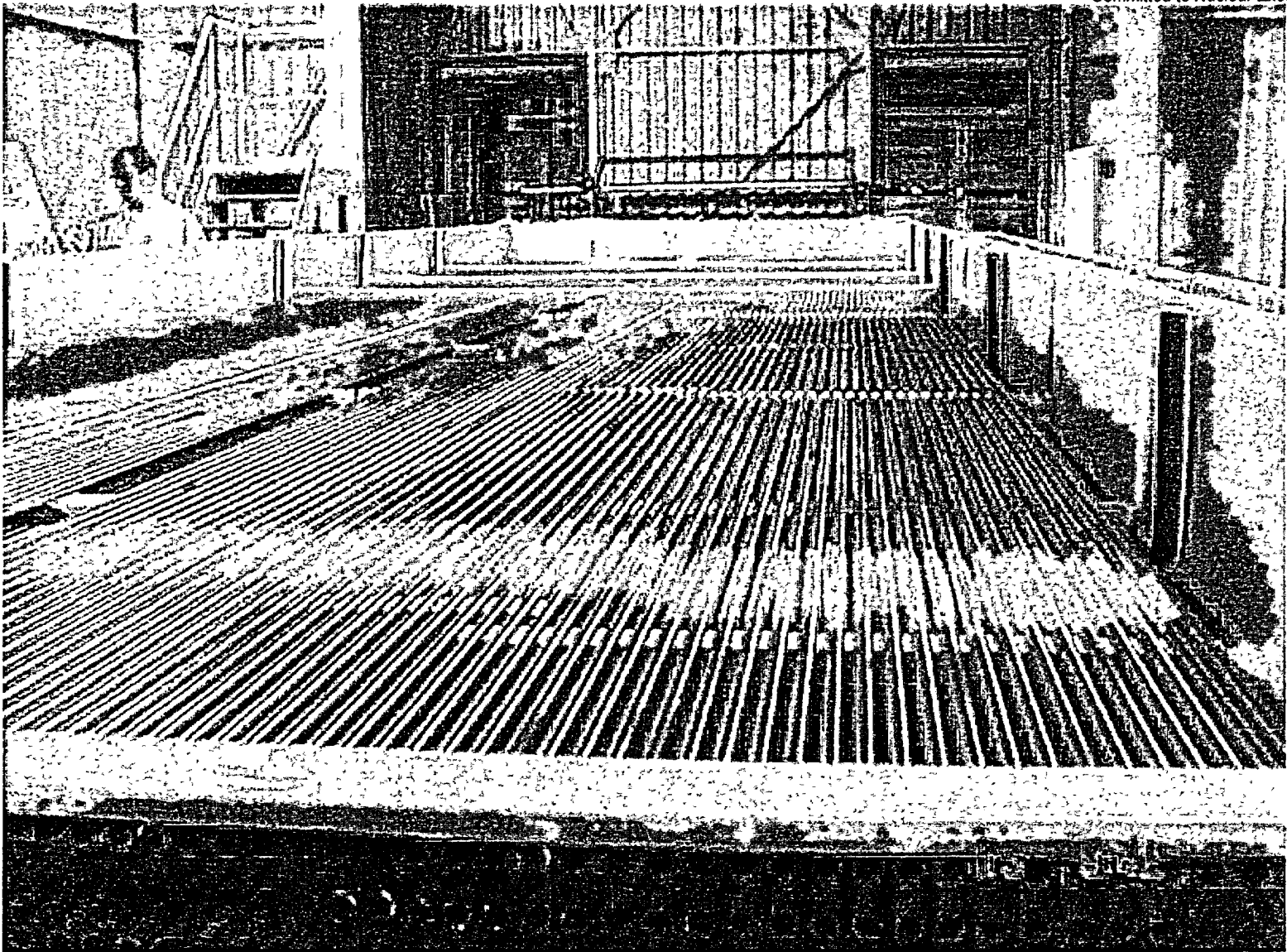
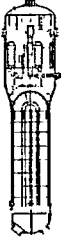
Framatome ANP Chalon / Saint Marcel

- Installation of Tubing began February 6, 2003 in 1st RSG
- Installation of tube support plates is next step for 2nd RSG
- Primary head nozzle machining and buttering completed. Safe ends are being welded on
- Steam dome shell nozzle forgings being installed

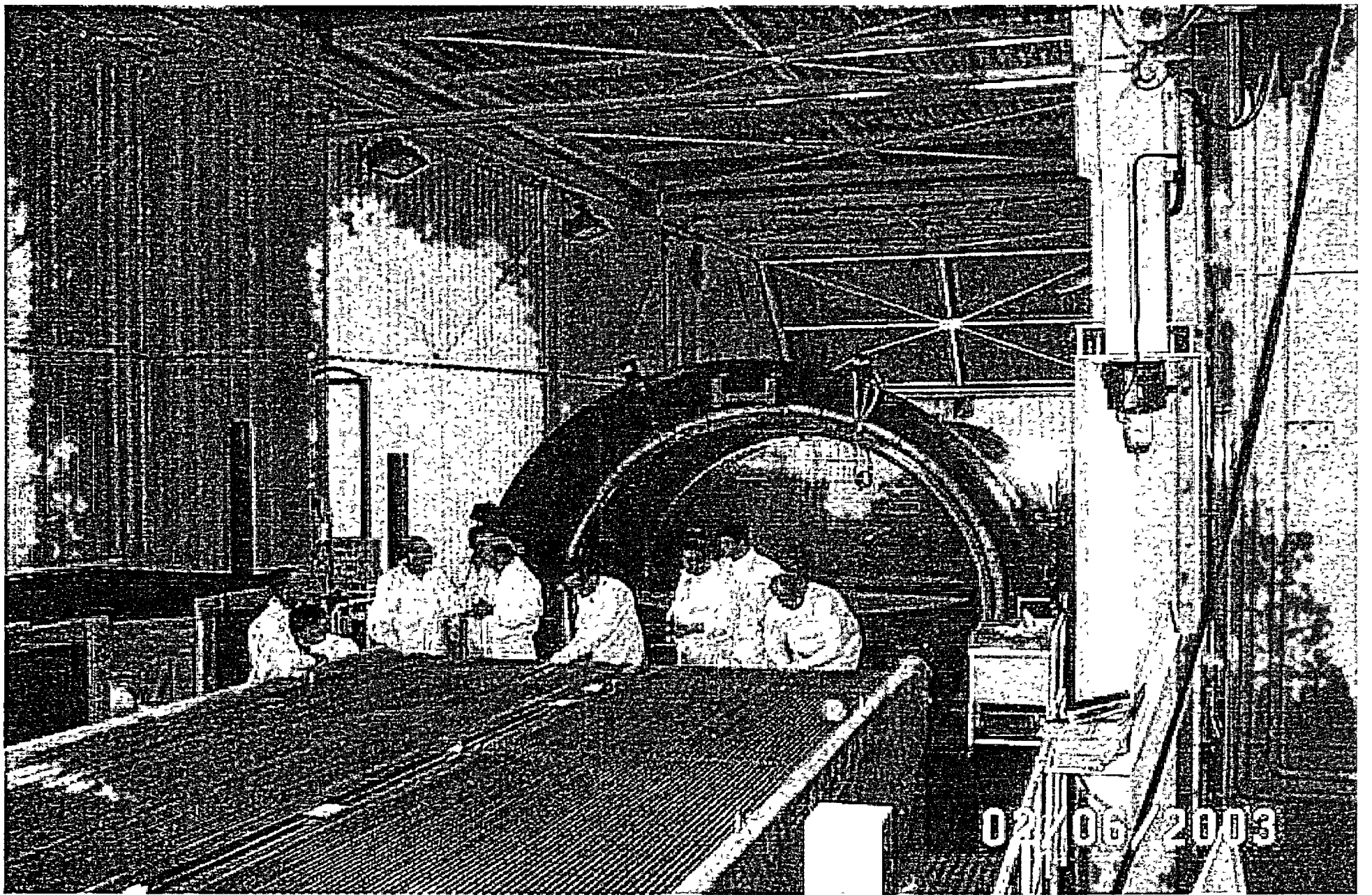


SGR Project Fabrication Pictures

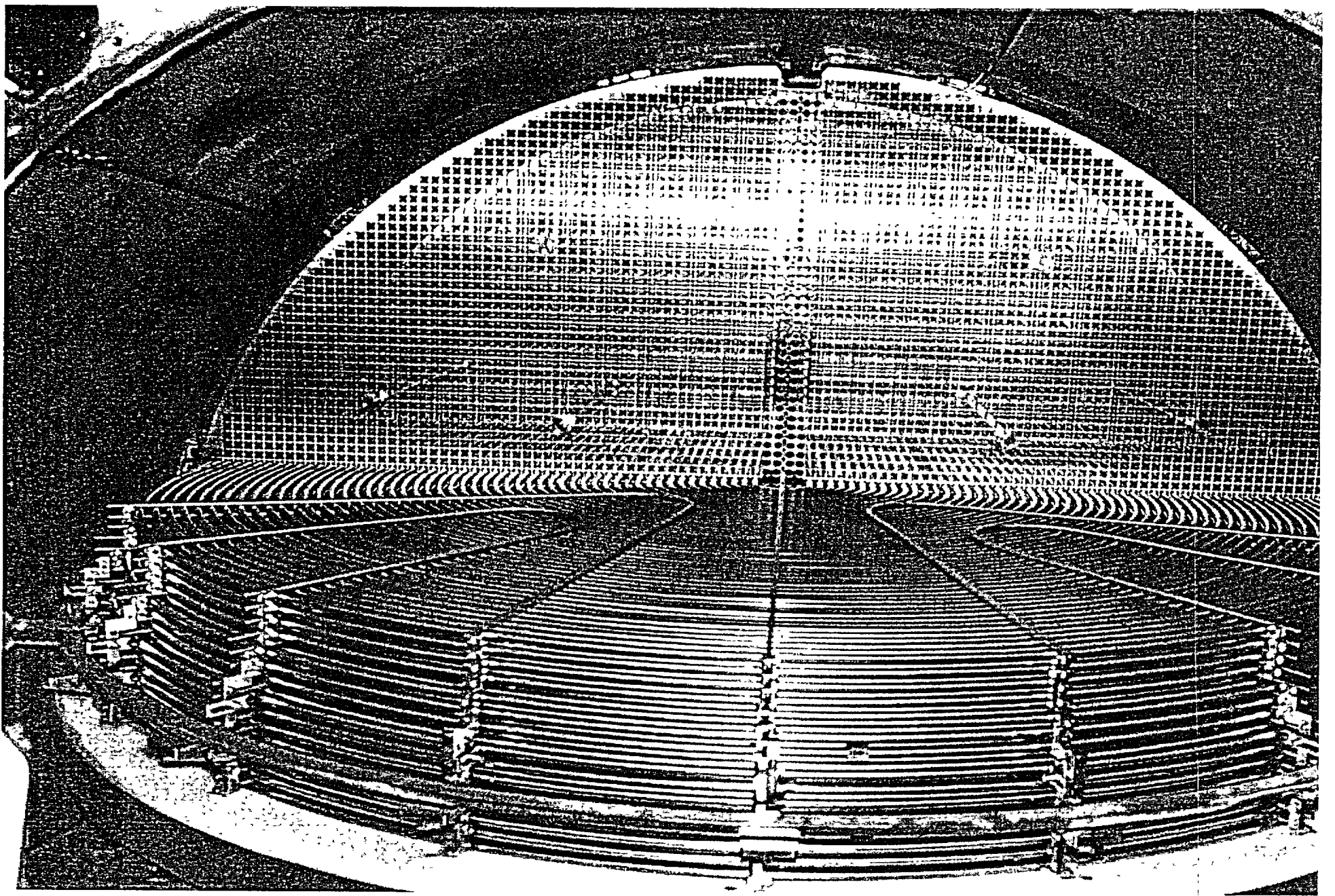
- Tube bundle – shipping box
- Tube bundle – GV/PI291 – beginning of tube bundle insertion.
- Partial Installation of Tubing/AVBs
- Tube-to-Tubesheet Welding
- Bundle Wrapper installation – GV/PI292



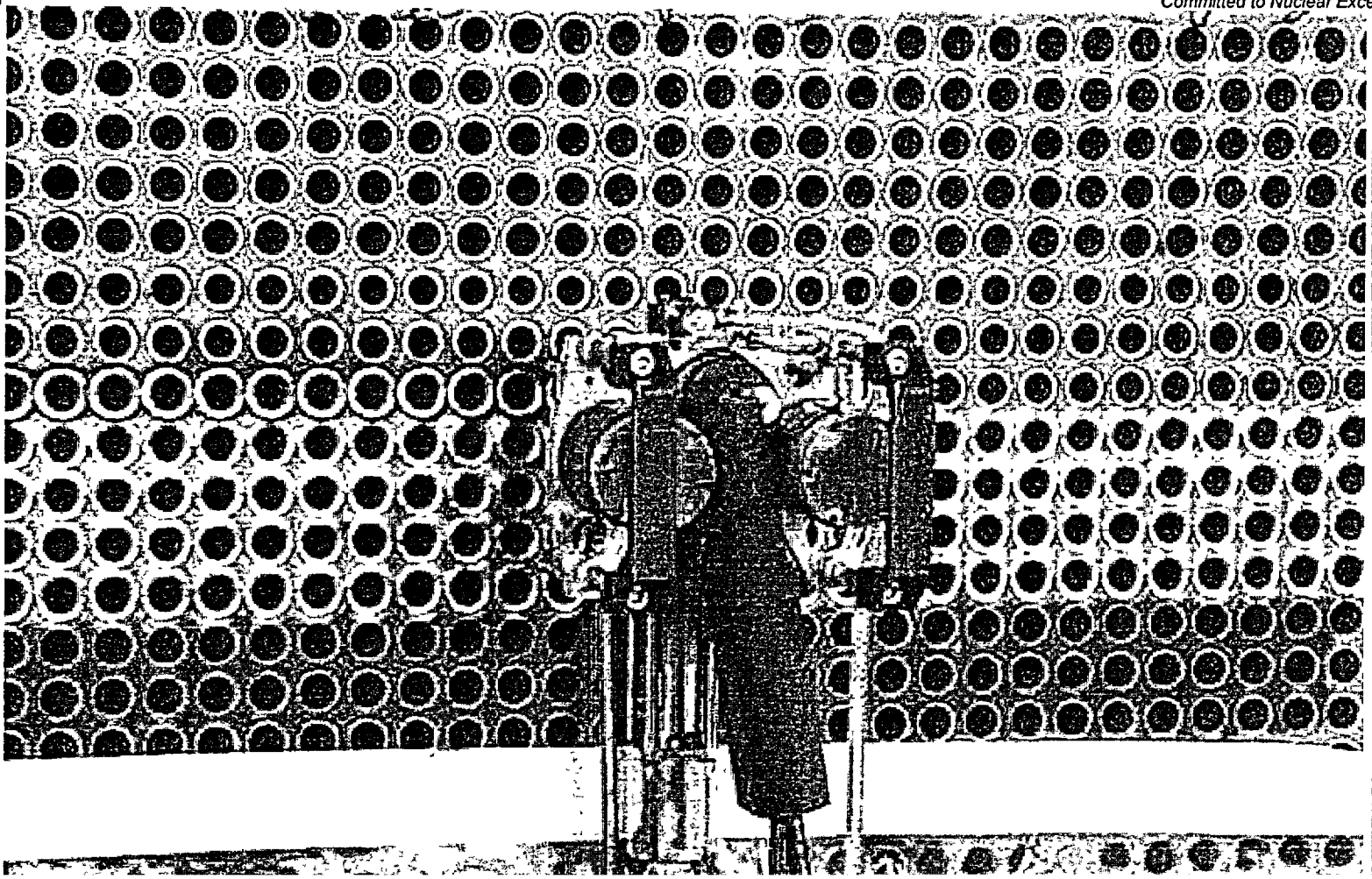
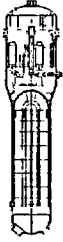
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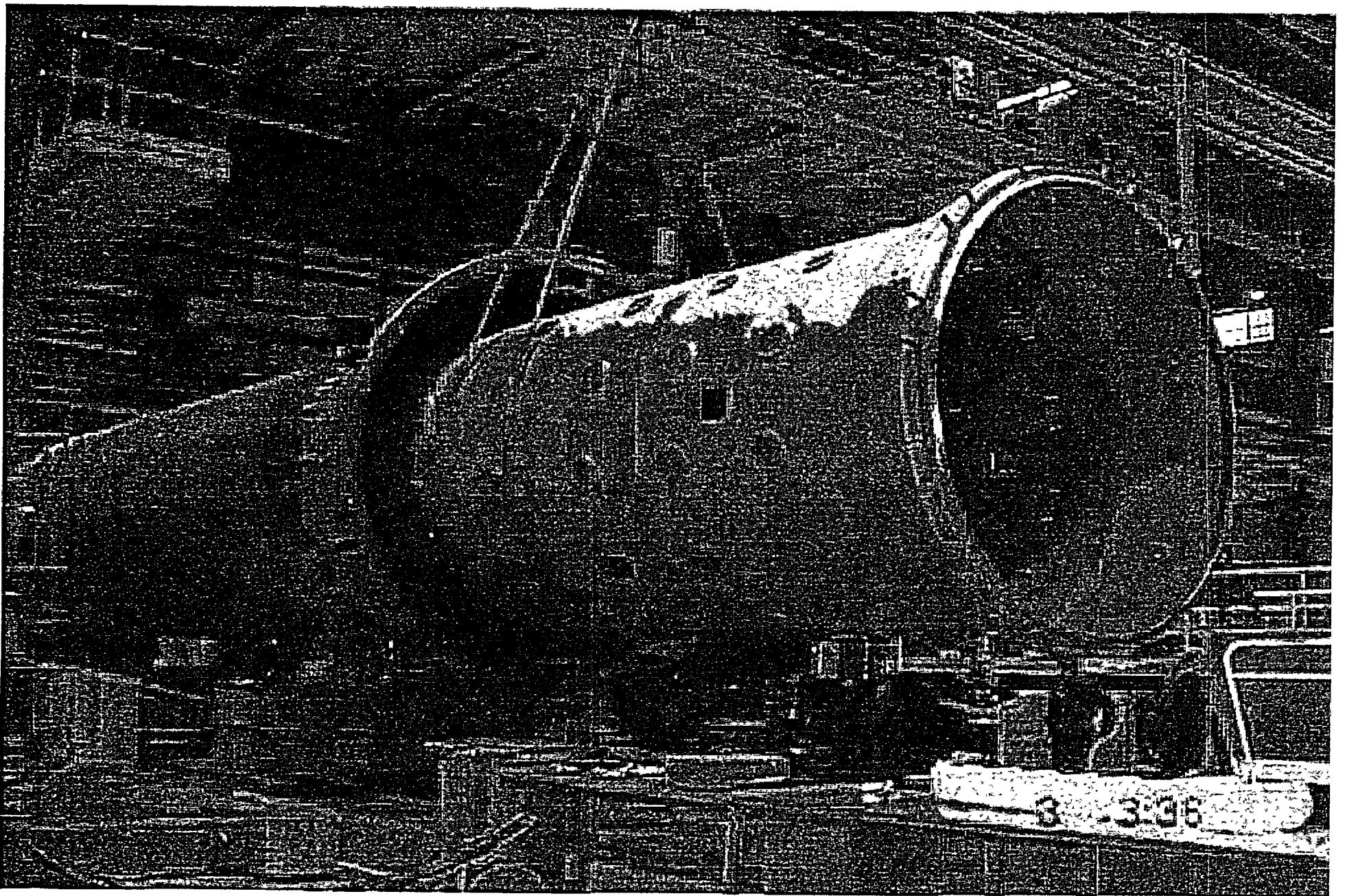


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SGR Project Tubing Quality

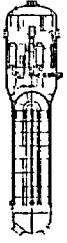
- Cleanliness Requirements during Processing
 - Contamination Surveillance Program
 - Cleaning Process Prior to Cold Pilgering
- Testing Done at Sandvik Tubing Mill to ensure quality
 - Standard ASME Section III
 - Inservice Inspectability
- Multi-frequency ET Testing of U-Bent Tubes (MIZ-30 Bobbin Coil)
 - Report
 - Reject
 - MRPC of Rows 1 through 9 u-bends
- Pre-service in Chalon, France
 - 100% Bobbin, full length
 - Expansion Transition, ± 3 inches, hot and cold leg



SGR Project Framatome ANP SAS Significant Non-Conformances

FRA N°	Rev.	Description	Included in the SFAR *
02/04014	0	Tube sheet GV/PI 292 - Deep Drilling	Yes
02/04017	0	Tube sheet GV/PI 291- Deep Drilling	Yes
02/04018	0	CVP GV/PI 292 (low er shell / tube sheet) Arc strike on low er shell	No
02/04023	1	Sandvik: Incorrect reporting on optical disk for ECT on tubes bundle column 49	No
02/04038	0	Orientation of 3 nozzles holes on the upper part - GV/PI 292	No

*SFAR – Stress and Fatigue Analysis Report



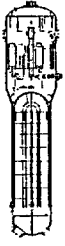
SGR Project Engineering

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Engineering Issues - ASME

- Request for Interpretation
 - Correct Stamp for Girth Weld – NPT
 - Requirement for Supplier Subcontract to Installation Vendor performing field Girth Weld
- ASME Code Edition and Addenda
 - NCA Current
 - Section III 95, 96 Addenda
 - Section XI 1989



SGR Project Engineering Considerations

- Applicability of LBB
- Compatibility with Plant Design
- Operational Impacts
 - Increase Steam Flow
 - Increase Steam Pressure



Effects of Recent Industry Experience

- Deck Plate – Diablo Canyon

- Tubing
 - Seabrook
 - Tubesheet Inspections



SGR Project

Oversight

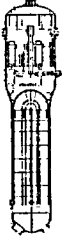
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SGR Project Oversight

Sandvik - Tubing

- Purchaser's Authorized Representative (PAR) Inspections
Hold 23
Witness 20
Record 3
- Purchaser Observation Reports (PORs)
Issued 8
Closed 8
Open 0



SGR Project Oversight

Framatome ANP - SG Fabrication

- Purchaser's Authorized Representative Inspections

Scheduled (witness / hold)	384
Unscheduled (walk-up)	155

- Purchaser Observation Reports

Issued	38
Closed	35



SGR Project Oversight



NMC Supplier QA

- NUPIC Joint Utility Audit of Framatome ANP SAS
June 2002
- NMC Surveillance of Framatome ANP Inc.
Jan 2003
- NUPIC Joint Utility Audit of Framatome ANP Inc.
Feb 2003
- Limited Scope Audit of Framatome ANP SAS - Chalon
June 2003

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SGR Project Future NRC Meetings

- Summer 2003 Region III Meeting
- Fall 2003 Licensing & Fabrication Update
- Spring 2004 Pre-Installation
- Others as needed