SAN ONOFRE NUCLEAR GENERATING STATION (SONGS)
STEAM GENERATOR REPAIR TEAM (SGR)
090412 Meeting Summary – SGR/MHI U3 Engineering Level 1 Process

MEETING PURPOSE:

The purpose of the meeting is to review and finalize SGR U3 Engineering Level 1 process flow charts with MHI.

SUMMARY:

- Reviewed SGR Engineering Level 1 Process R2 document with no comments:
- Reviewed SGR Bundle Repair Option for Type 3 R1 document with the following comments:
  - Move "CDR" prior to "Final Design and Third Party Review"
  - Add Definition box
  - Remove 'Start" from "Start Manufacturing TS / Tubes / TSP" Identify Manufacturer" to "Manufacturer to Start"
  - Change "Test" to "Deferred Test"
- Reviewed SGR Memorialize Decision Map R1 charts with the following comments:
  - Add on page 6 of 6 Note: "% Power is best estimate. Final Determination of Run Time / % Power will be determined in the Operational Assessment."
- All of the above comments were incorporated and documents were approved and signed by Director of Steam Generator Repair (SGR) Team and Director of MNES Steam Generator Repair SONGS Site team (See Attached).

Attachments: Attendees,
Engineering Level 1 Process,
Bundle Repair Option for Type 3 Repair Option,
Memorialize Decision Map

SAN ONOFRE NUCLEAR GENERATING STATION (SONGS)
STEAM GENERATOR REPAIR TEAM (SGR)
090412 Meeting Summary – SGR/MHI U3 Engineering Level 1 Process
ATTACHMENT – Meeting Attendees

REDACTED

SAN ONOFRE NUCLEAR GENERATING STATION (SONGS)
STEAM GENERATOR REPAIR TEAM (SGR)
090412 Meeting Summary – SGR/MHI U3 Engineering Level 1 Process
ATTACHMENTS

Please see attached pages 4 through 11 for the following attachments:

ATTACHMENT 1 – SGR Engineering Level 1 Process
ATTACHMENT 2 – Bundle Replacement Option
ATTACHMENT 3 – Decision Point Matrix (1 through 6)

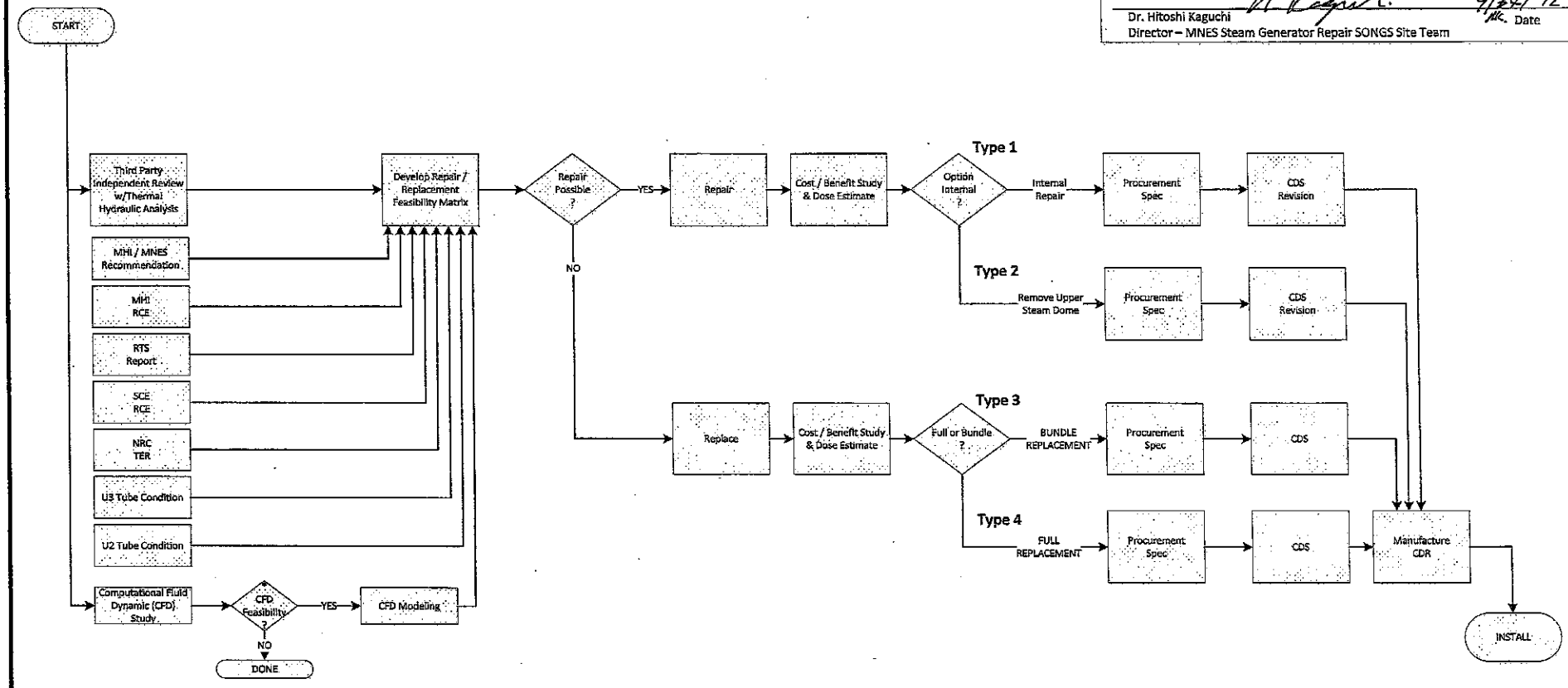
SGR Team – Engineering Level 1 Process

Unit 3 – Steam Generator Repair Option Development

APPROVED

Ed Avella — Date
Director – Steam Generator Repair (SGR) Team

Dr. Hitoshi Kaguchi — Date
Director – MNES Steam Generator Repair SONGS Site Team



DEFINITIONS:

CDR:	Certified Design Report
CDS:	Certified Design Specification
CFD:	Computational Fluid Dynamic
RTS:	Return to Service Team
NRC:	Nuclear Regulatory Commission
MHI:	Mitsubishi Heavy Industries
MNES:	Mitsubishi Nuclear Energy Services
RCE:	Root Cause Evaluation
TER:	Technical Evaluation Report

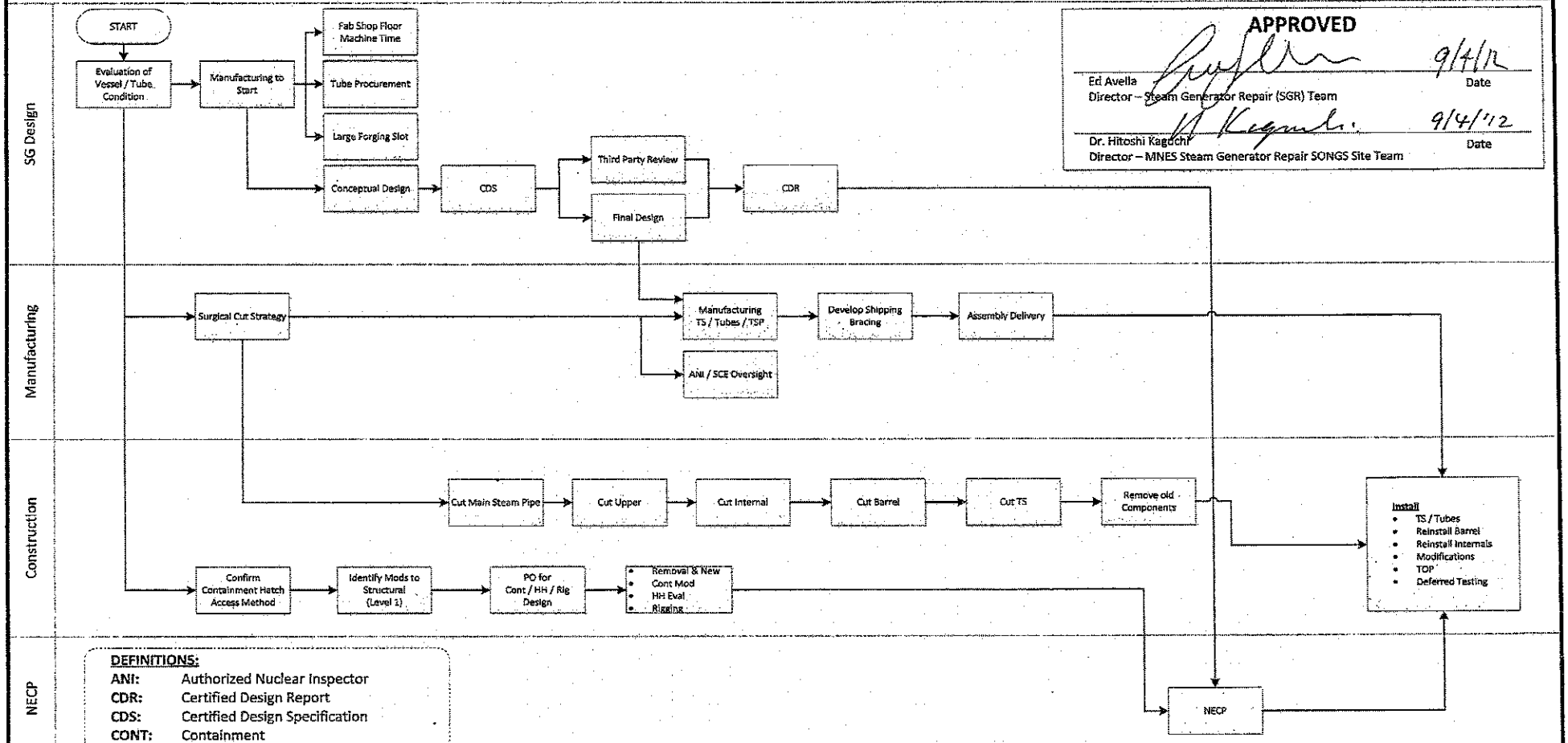
NOTES:

- Four major groups of modifications
- Subgroups will be numbered 1.1, 1.2, etc.
- *CFD study is a first-of-a-kind and may not be feasible

Steam Generator Repair (SGR) Team
GDSP Model

SHEET#	REV	DESCRIPTION	DATE	APPROVED
1 OF 1	0	SGR Team – Engineering Level 1 Process	08/29/12	MM
1 OF 1	1	Incorporate MHI Comments	08/30/12	MM
1 OF 1	2	Incorporate SCE Comments	09/04/12	MM

Steam Generator Repair (SGR) Team – Type 3 Repair Option (See Level 1 Process)



APPROVED

Ed Avella — Director – Steam Generator Repair (SGR) Team — 9/4/12 Date

Dr. Hitoshi Kaguchi — Director – MNES Steam Generator Repair SONGS Site Team — 9/4/12 Date

DEFINITIONS:

ANI:	Authorized Nuclear Inspector
CDR:	Certified Design Report
CDS:	Certified Design Specification
CONT:	Containment
HH:	Heavy Haul
MODS:	Modifications
NECP:	Nuclear Engineering Change Package
PO:	Purchase Order
RIG:	Rigging
SCE:	Southern California Edison
TOP:	Turn Over Package
TS:	Tube Sheet
TSP:	Tube Support Plate

OPTION LIST

- Option 3.1 Tubes Only
- Option 3.2 Replace Tubes & Bowl
- Option 3.3 Replace Tubes In-Kind

Steam Generator Repair (SGR) Team
GOSP Model

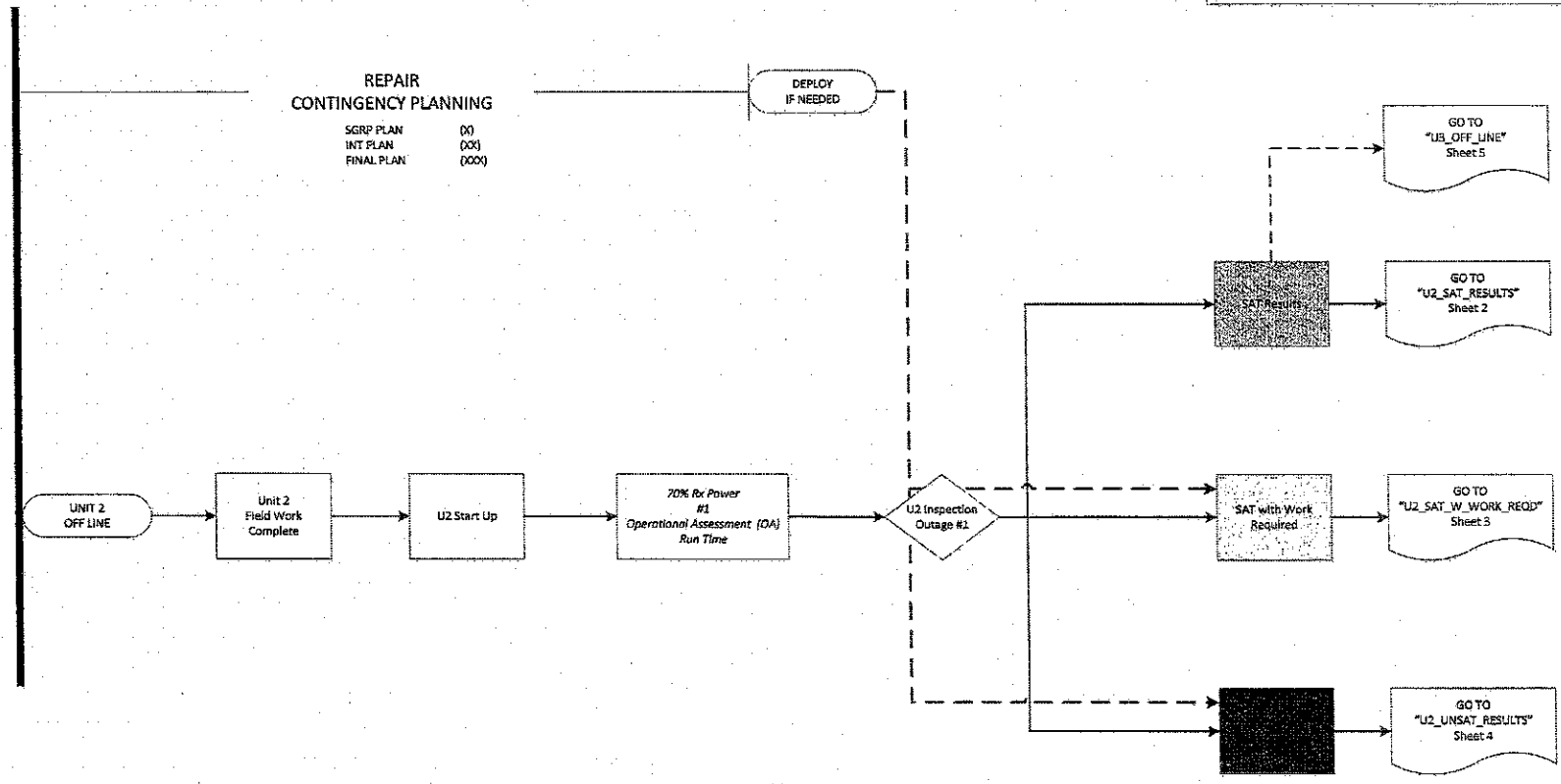
SHEET#	REV	DESCRIPTION	DATE	APPROVED
1 OF 1	0	Bundle Replacement Option(s) See Option List	08/29/12	MM
1 OF 1	1	Incorporate MHI Comments	08/30/12	MM
1 OF 1	2	Incorporate SCE Comments	09/04/12	MM

Steam Generator Repair (SGR) Team

APPROVED

Ed Avella — 9/4/12
Director – Steam Generator Repair (SGR) Team — Date

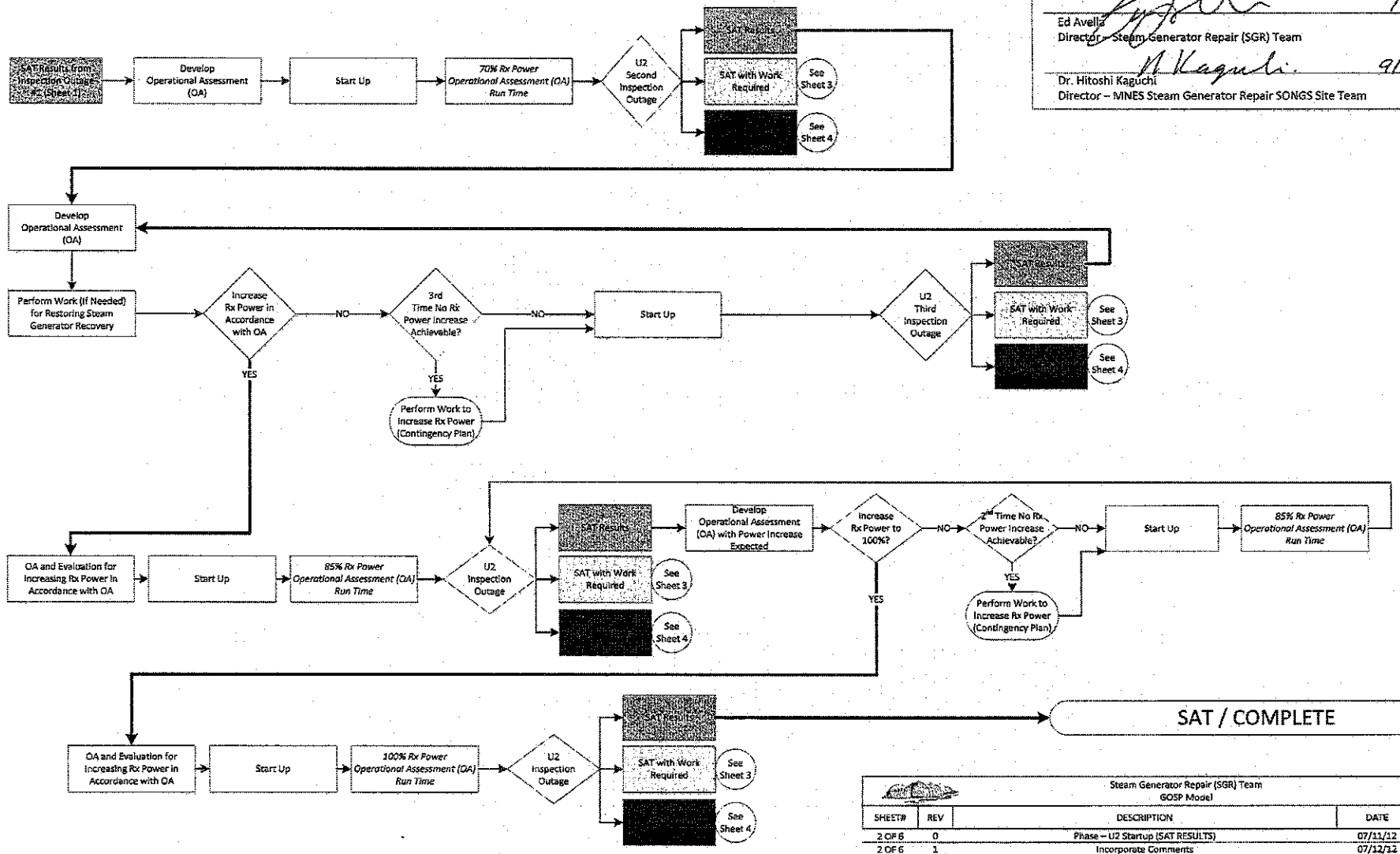
Dr. Hitoshi Kaguchi — 9/4/'12
Director – MNES Steam Generator Repair SONGS Site Team — Date



Steam Generator Repair (SGR) Team
GOSP Model

SHEET#	REV	DESCRIPTION	DATE	APPROVED
1 OF 6	0	Phase – U2 Startup (MAIN)	07/11/12	EA
1 OF 6	1	Incorporate Comments	07/12/12	EA
1 OF 6	2	Incorporate MHI Comments	08/30/12	MM

Steam Generator Repair (SGR) Team



APPROVED

Ed Avella — Date 9/4/12
Director – Steam Generator Repair (SGR) Team

Dr. Hitoshi Kaguchi — Date 9/4/12
Director – MNES Steam Generator Repair SONGS Site Team

Steam Generator Repair (SGR) Team
GOSP Model

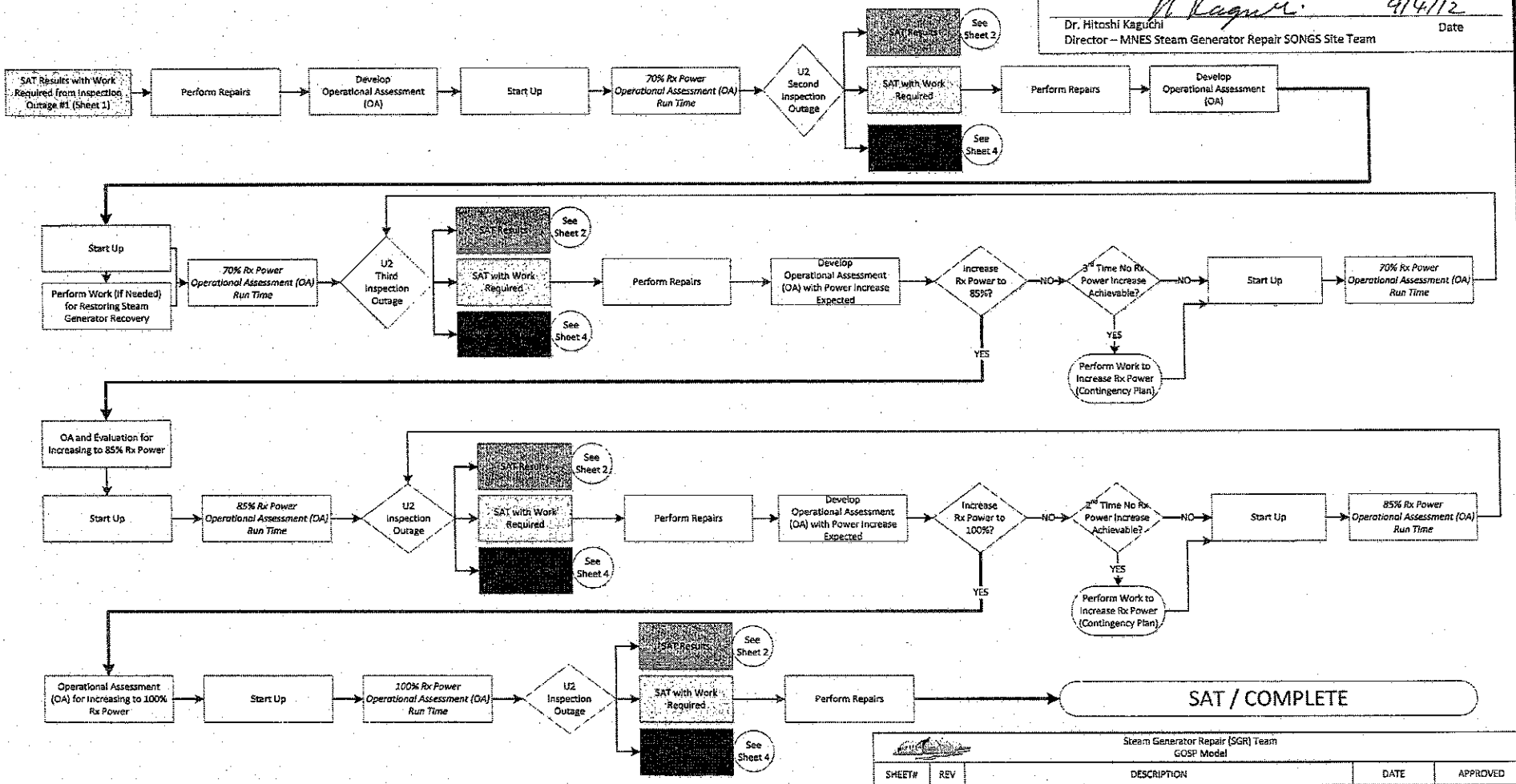
SHEET#	REV	DESCRIPTION	DATE	APPROVED
2 OF 6	0	Phase – U2 Startup (SAT RESULTS)	07/11/12	EA
2 OF 6	1	Incorporate Comments	07/12/12	EA
2 OF 6	2	Incorporate MHI Comments	08/30/12	MM

Steam Generator Repair (SGR) Team

APPROVED

Ed Avella — 9/4/12
Director – Steam Generator Repair (SGR) Team — Date

Dr. Hitoshi Kaguchi — 9/4/12
Director – MNES Steam Generator Repair SONGS Site Team — Date



Steam Generator Repair (SGR) Team
GOSP Model

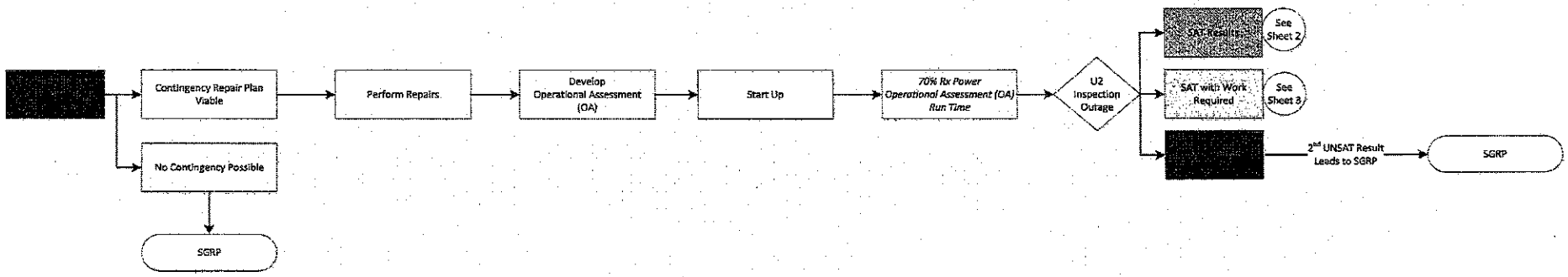
SHEET#	REV	DESCRIPTION	DATE	APPROVED
3 OF 6	0	Phase – U2 Startup (SAT w/Work Required)	07/11/12	EA
3 OF 6	1	Incorporate Comments	07/12/12	EA
3 OF 6	2	Incorporate MHI Comments	08/30/12	MM

Steam Generator Repair (SGR) Team

APPROVED

Ed Avella — Date 9/4/12
Director – Steam Generator Repair (SGR) Team

Dr. Hitoshi Kaguchi — Date 9/4/12
Director – MNES Steam Generator Repair SONGS Site Team



Steam Generator Repair (SGR) Team
GOSP Model

SHEET#	REV	DESCRIPTION	DATE	APPROVED
4 OF 6	0	Phase – U2 Startup (UNSAT Results)	07/11/12	EA
4 OF 6	1	Incorporate Comments	07/12/12	EA
4 OF 6	2	Incorporate MHI Comments	08/30/12	MM

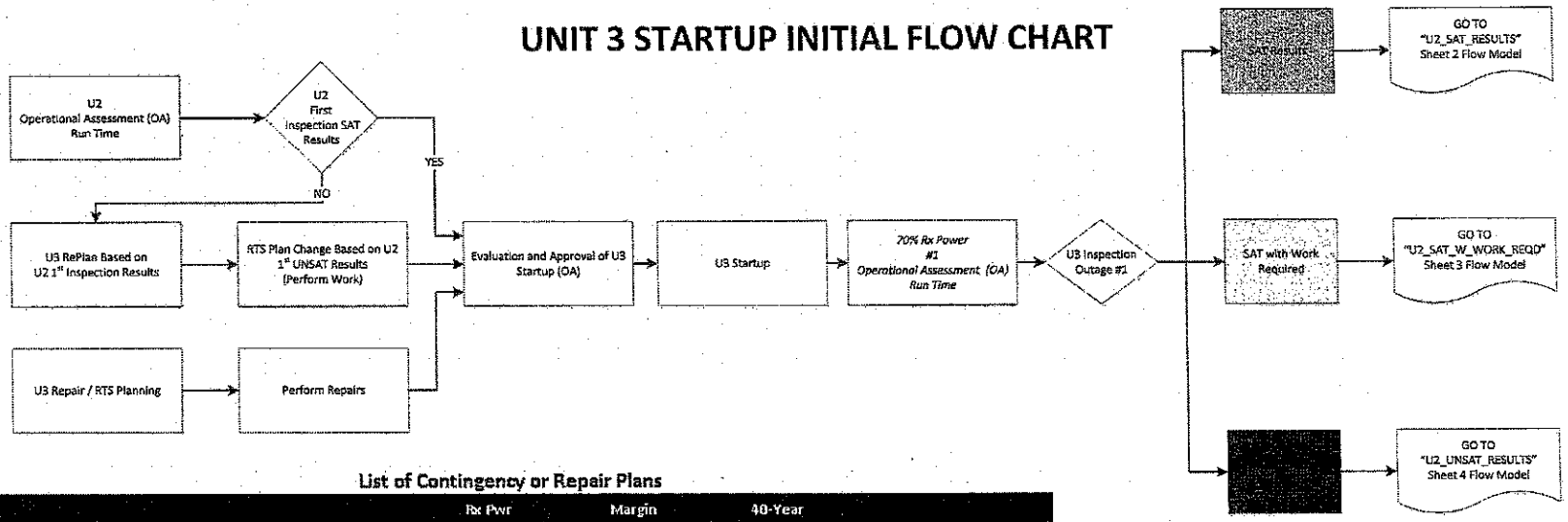
Steam Generator Repair (SGR) Team

APPROVED

Ed Avella — Date 9/4/12
Director – Steam Generator Repair (SGR) Team

Dr. Hitoshi Kaguchi — Date 9/4/12
Director – MNES Steam Generator Repair SONGS Site Team

UNIT 3 STARTUP INITIAL FLOW CHART



List of Contingency or Repair Plans

Name	Desc.	Rx Pwr Increase (YES/NO)	Pwr Level	Margin Return (YES/NO)	Margin %	40-Year Life (YES/NO)	Notes
Tube Expansion	Hydraulic tube expansion in the areas of AVBs.	YES	85%	YES	20%	YES	Table in development
Tube Plugging and Stabilization	Insertion of stabilizers and tube plugging.	YES	85%	YES	20%	YES	Table in development
EXAMPLE							
EXAMPLE							
EXAMPLE							
EXAMPLE							
EXAMPLE							
EXAMPLE							

*Example of "PrePlan" repairs that support flow chart results

Steam Generator Repair (SGR) Team
GOSP Model

SHEET#	REV	DESCRIPTION	DATE	APPROVED
5 OF 6	0	Phase – U2 Startup (U3 Off Line)	07/11/12	EA
5 OF 6	1	Incorporate Comments	07/12/12	EA
5 OF 6	2	Incorporate MHI Comments	08/30/12	MM/MPM

Steam Generator Repair (SGR) Team

APPROVED

Ed Avella — Director – Steam Generator Repair (SGR) Team — 9/4/12 Date

Dr. Hitoshi Kaguchi — Director – MNES Steam Generator Repair SONGS Site Team — 9/4/12 Date

100% Reactor Power, Operational Assessment (OA), Run Time - The unit is in Mode 1 and operating at 100% reactor power for duration set by the Operational Assessment.

70% Reactor Power, #1 Operational Assessment (OA), Run Time – The unit is in Mode 1 and operating at 70% reactor power for duration set by the Operational Assessment.

70% Rx Power, Operational Assessment (OA), Run Time - The unit is in Mode 1 and operating at 70% reactor power for duration set by the Operational Assessment.

85% Reactor Power, Operational Assessment (OA), Run Time - The unit is in Mode 1 and operating at 85% reactor power for duration set by the Operational Assessment.

Contingency Repair Plan Viable - A repair/modification has been analyzed and qualified for implementation. The repair/modification will return the unit to 100% power operation for the expected component life.

Deploy if Needed – Implementation of a repair strategy. Contracts, logistics and support in place to minimize downtime. Trigger established based on steam generator inspection results.

Develop Operational Assessment (OA) – Develop the operational assessment based on the results of the inspections and testing conducted during the first inspection outage.

Increase Reactor Power to 100% - Decision point based on Operational Assessment following SAT inspection at 85% power.

Increase Reactor Power to 85% - Decision point based on Operational Assessment following three (3) SAT inspections.

No Contingency Possible – A repair/modification has not been developed to achieve 100% power operation for the expected life of the components. This includes repair/modification to provide interim 100% power operation or less for a period less than the expected life of the component. This decision may require a business case to demonstrate actual returns.

Perform Repairs – Anticipated installation of tube plugs and stabilizers based on the inspection results. No modifications are proposed in this scenario.

Perform Work / Evaluation for Increasing to 85% Reactor Power – Implement the recommendations of the Operational Assessment to support 85% reactor power operation.

Perform Work / Legal for Increasing to 100% Reactor Power - Implement the recommendations of the Operational Assessment to support 100% reactor power operation.

Repair Contingency Planning – Development of repair strategies for potential degradation mechanism experienced during plant operation. Evaluation of the repair strategies for constructability. Generation of contracts that would be necessary for implementation of the repair strategies.

SAT / COMPLETE – No evidence of tube to tube wear from Fluid Elastic Instability (FEI). Normal wear as predicted by the Operational Assessment for the duration of operation. The Operational Assessment concludes the health of the steam generator is acceptable for 100% power operation for the expected life of the components.

SAT Results – No evidence of tube to tube wear from Fluid Elastic Instability (FEI). Normal wear as predicted by the Operational Assessment for the duration of operation. No tube plugging, stabilization or modifications required for continued operation.

SAT Results with Work Required - No evidence of tube to tube wear from Fluid Elastic Instability (FEI). Normal wear as predicted by the Operational Assessment for the duration of operation. Anticipated / planned tube plugging or stabilization of some tubes required. No modifications required for continued operation.

SGRP – Replacement of the Steam Generator(s)

Start Up – All unit startup prerequisites have been met. Regulatory approval for startup, if required, has been obtained. The unit is ready to begin power ascension.

Unit 2 Field Work Complete - All field work is complete and all systems, structures and components returned to Operations. Unit is ready to resume power operation.

Unit 2 Inspection Outage - Unit 2 in Mode 5 or 6 with the ability to perform work activities in the steam generators. Inspections and testing of the steam generators as required by the Operational Assessment to be conducted.

Unit 2 Inspection Outage #1 - Unit 2 in Mode 5 or 6 with the ability to perform work activities in the steam generators. Inspections and testing of the steam generators as required by the Operational Assessment to be conducted.

Unit 2 Off Line - Unit 2 in Mode 5 or 6 with the ability to perform work activities in the steam generators.

Unit 2 Start Up – Initial unit startup after refueling outage. All unit startup prerequisites have been met. Regulatory approval for startup has been obtained. The unit is ready to begin power ascension.

Unit 3 Inspection Outage #1 - Unit 3 in Mode 5 or 6 with the ability to perform work activities in the steam generators. Inspections and testing of the steam generators as required by the Operational Assessment to be conducted.

Unit 3 Start Up – Initial unit startup after forced outage. All unit startup prerequisites have been met. Regulatory approval for startup has been obtained. The unit is ready to begin power ascension.

UNSAT Results - Evidence of tube to tube wear from Fluid Elastic Instability (FEI) or wear greater than predicted by the Operational Assessment for the duration of operation. Unanticipated / unplanned tube plugging or stabilization of tubes required. Modifications required for continued operation.

NOTE:
% Power is best estimate. Final Determination of Run Time / % Power will be determined in the Operational Assessment.

Steam Generator Repair (SGR) Team
GOSP Model

SHEET#	REV	DESCRIPTION	DATE	APPROVED
6 OF 6	0	Flow Chart Definitions	07/11/12	EA
6 OF 6	1	Incorporate Comments	07/12/12	EA
6 OF 6	2	Incorporate MHI Comments	09/04/12	MM