

October 30, 1996

Duke Power Company
ATTN: Mr. W. R. McCollum
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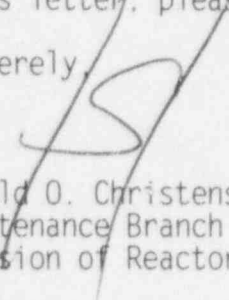
SUBJECT: MEETING SUMMARY - CATAWBA

This refers to the management meeting conducted in the Region II Office on October 23, 1996. The purpose of the meeting was to discuss the welding program. A list of attendees and a copy of your slides are enclosed.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and its enclosures will be placed in the NRC Public Document Room.

Should you have any questions concerning this letter, please contact us.

Sincerely,


Harold O. Christensen, Chief
Maintenance Branch
Division of Reactor Safety

Docket Nos.: 50-413 and 50-414
License Nos.: NPF-35 and NPF-52

Enclosures:

1. List of Attendees
2. Licensee Slides

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

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COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY

DOCUMENT NAME: P:\CATAWBA.MSM

LIST OF ATTENDEES

Nuclear Regulatory Commission

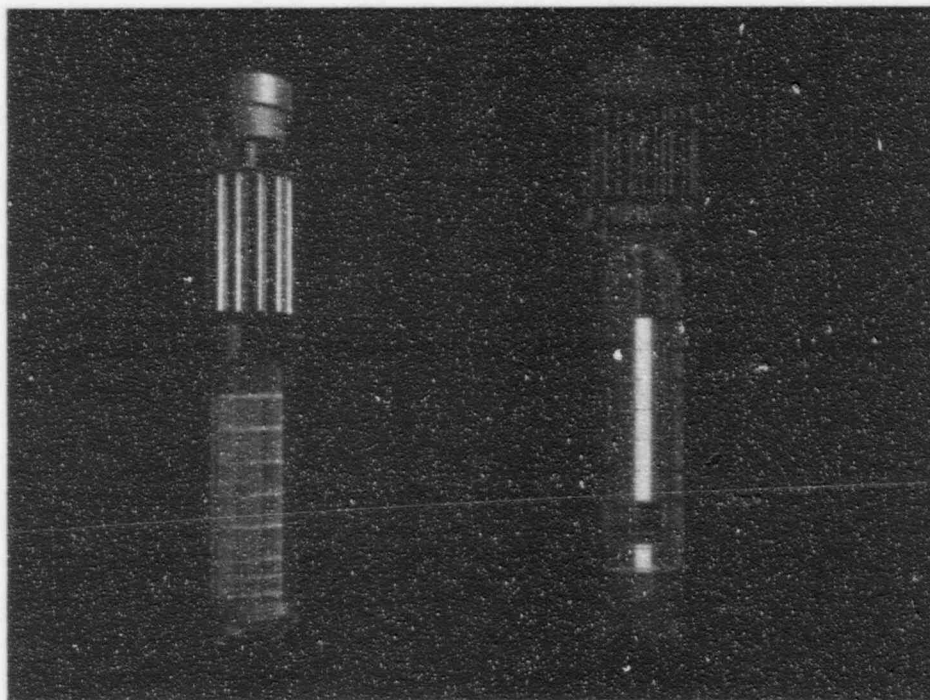
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M. R. Robinson, DPC
M. S. Sills, Site Manager, DPC
G. Hallman, SGRP Overall Manager, DPC
J. Grogan, Vice President, ESS, DPC
M. Tuckman, Senior Vice President, DPC
T. McConnell, Station Support Manager, DPC
A. Grunsky, Service Manager, DPC
S. VanMalsser, Work Management, DPC

Duke Power Company WELDING PROGRAM

**Steam
Generator**



**Replacement
Project**

**Nuclear Generation Department
October 23, 1996**

Agenda

- ◆ **Introductory Remarks (MST)**
- ◆ **Catawba SGRP Experience (WRM)**
- ◆ **Welding Program Improvements (TLM)**
- ◆ **McGuire SGRP Plans (TCM)**
- ◆ **Summary (TCM)**
- ◆ **Adjourn**

Introductory Remarks

- ◆ Introduction
- ◆ Purpose of this Meeting
- ◆ Current State
- ◆ Cause
- ◆ Corrective Actions

Introduction

- ◆ Catawba SGRP the largest project since construction
- ◆ Pleased with all project aspects except secondary welding
- ◆ NRC and Duke identified issues with SGRP secondary welding
- ◆ Duke has identified issues with our overall welding program
- ◆ We've taken actions to improve overall welding program and McGuire SGRP

Purpose of Meeting

- ◆ Describe Catawba SGRP welding issues and actions taken
- ◆ Describe Duke welding program and actions to be taken
- ◆ Describe how we will make McGuire SGRP secondary welding successful

Present State

- ◆ Our corporate welding program is in need of improvement
- ◆ Catawba SGRP project management did not adequately plan for secondary welding
- ◆ Oconee is in outage and McGuire SGRP is near term

Cause

- ◆ SGRP management failed to recognize the deficiencies in the corporate welding program and drive improvements
- ◆ The effectiveness of our corporate welding program had been slowly eroding over time

Cause Details

- ◆ SGRP Project management
 - Inadequate readiness assessment in this area (8 other readiness assessments conducted)
 - Inadequate technical support
 - ▼ Planning phase missed secondary welding issues as area of potential concern (over-confidence)
 - ▼ Missed significance of pre-outage pre-fab indicators in execution phase

Cause Details

- ◆ Corporate Welding Program
 - Lack of ownership of corporate program
 - Qualification vs Skill
 - Inadequately focused weld tech support

Corrective Actions

- ◆ Completed Catawba welding
 - All welds are acceptable and meet code
- ◆ Implement Corporate Welding Team recommendations
- ◆ Specific action plan to ensure McGuire success

Catawba SGRP Experience

Bill McCollum

Catawba SGRP Experience

- ◆ Welding Plan
 - Primary Side
 - Secondary Side
- ◆ Pre-Fab Results & Response
- ◆ Field Problems & Response
- ◆ Summary

Welding Plan - Primary Side

- ◆ Reactor coolant pipe - 8 welds, approx. 2.5" wall, 36" OD, stainless steel
- ◆ Welding on or near critical path for the outage
- ◆ Potential high dose job
- ◆ Narrow gap automated welding process selected for
 - Significant reduction in volume of weld metal
 - Less shrinkage
 - Reduced duration
 - Excellent results in other plants

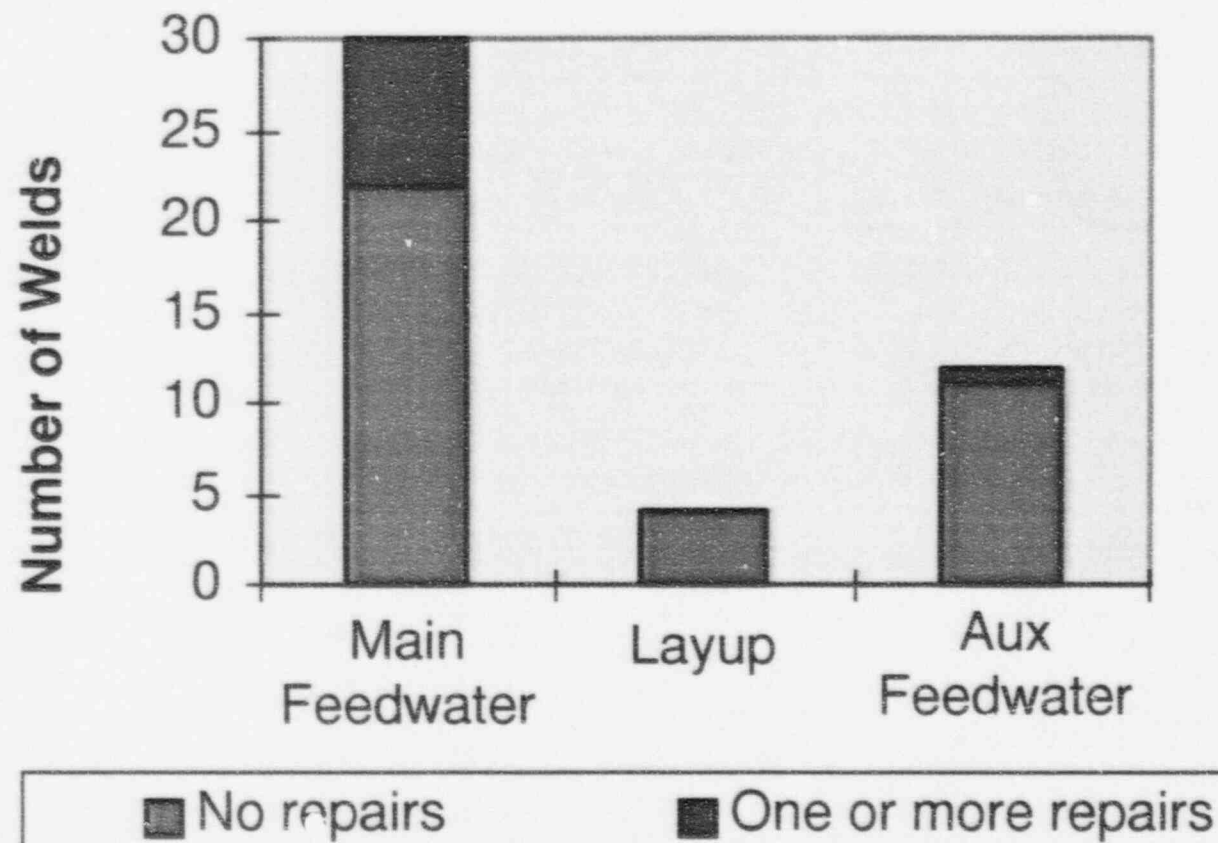
Welding Plan - Secondary Side

- ◆ Pre-fab
 - 46 butt welds , 16” to 3”
 - Approx 200 socket welds , 2” and less
- ◆ Field welds
 - 82 butt welds, 34” to 3”
 - Approx 200 socket welds , 2” and less
- ◆ Considerations for the plan
 - Range of sizes and space limitations
 - Types of welds not dissimilar to welding performed in past
 - Off critical path

Welding Plan - Secondary Side

- ◆ Planned all secondary side welding with manual processes
 - Main feedwater reroute was the largest welding scope
 - Planned pre-fab to serve as verification of plan for field welding

SGRP Pre-Fab Butt Welds



Pre-Fab Results

- ◆ Pre-fab problems were with root pass on CrMo feedwater piping
- ◆ No significant reject issues with other welds
- ◆ Feedback from welders indicated TIG filler material problem

Response to Pre-Fab Problems

- ◆ Evaluation of filler and base material
- ◆ Searched for alternate filler material
- ◆ Tested non-qualified filler material
- ◆ Success rate improved
- ◆ Decision to proceed with existing filler material based on improvement during pre-fab

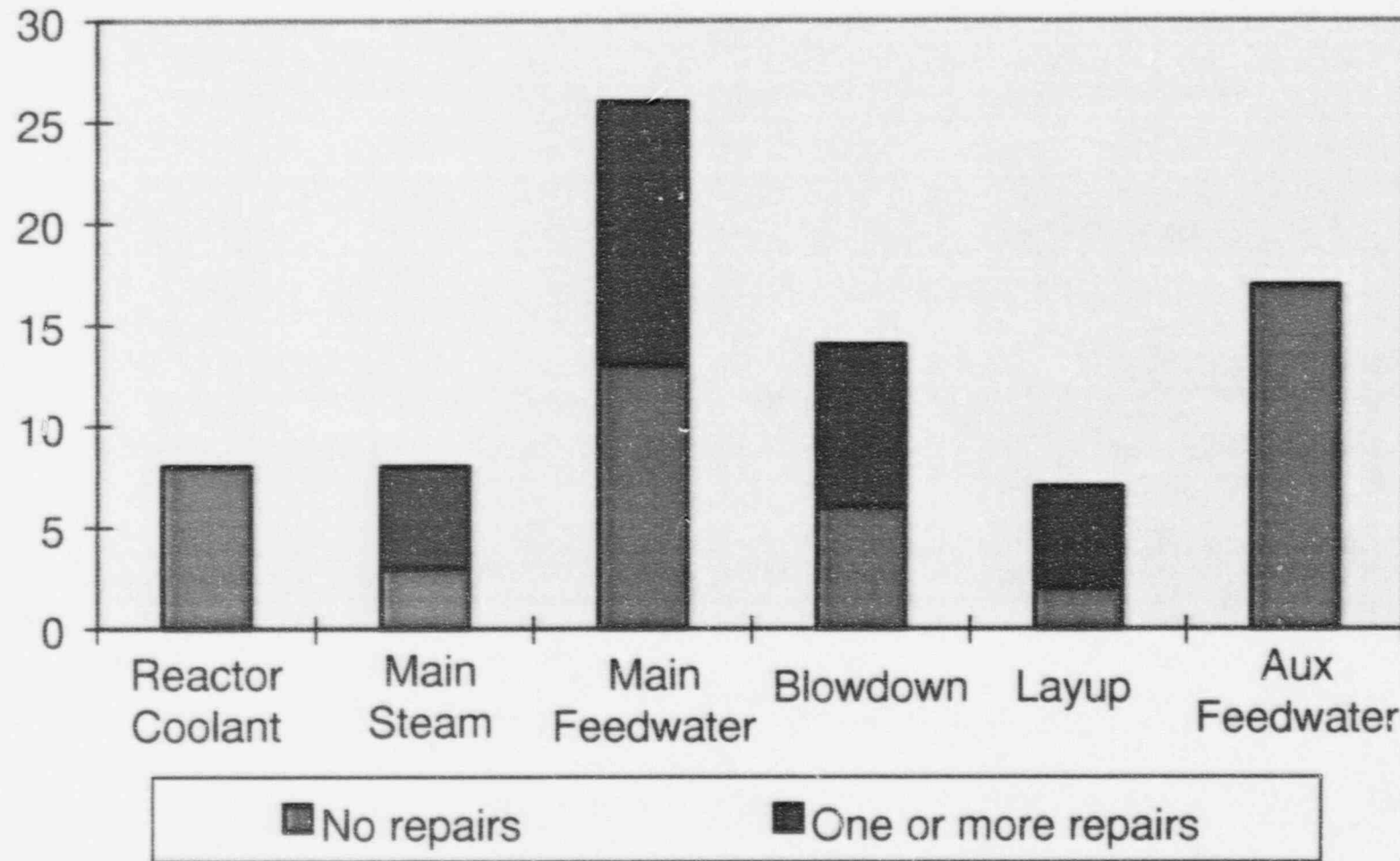
Field Successes

- ◆ All auxiliary feedwater nozzle welds and 12 in-line welds were completed with no repairs
- ◆ Socket welds completed with no rejects

Field Problems

- ◆ Problems with preheat practices
- ◆ Difficulty with feedwater CrMo
 - Root pass problems similar to pre-fab
- ◆ Problems with dissimilar metal
INCONEL nozzle welds, (Blowdown
and Layup)

SGRP Field Butt Welds



Response to Field Problems

- ◆ 8/9/96 - SGRP welding work stopped in response to problems identified with preheat practices
 - Reviewed preheat practices and provided additional guidance for welders
 - Timeout discussion with welders and QC inspectors to review preheat guidance
 - Increased QC random in-process inspections
 - Stopped torch preheat & developed procedure on preheat practice

Response to Field Problems

- ◆ 8/12/96 - Brought in experienced welding engineer as issue manager for SGRP welding problems
- ◆ Site management chartered independent assessment of SGRP welding program (Experienced QC Manager, Outside Welding Consultant, Experienced Welding Tech Support Personnel)

Response to Field Problems

- ◆ Independent Assessment Results
 - Specific knowledge of process specifications and other program requirements need improvement
 - Details of QC inspection practice varied between inspectors
 - Less automated welding used compared to other projects of this magnitude

Response to Field Problems

- ◆ Independent Assessment Results
 - Need for greater management oversight
 - ▼planning
 - ▼increased technical support
 - ▼more technical content in pre-job briefings
 - All Code, QA and procedure requirements were being met

Response to Field Problems

- ◆ Beginning 8/12/96 - Focused additional welding expertise (Duke and Consultant) to develop solutions to reject issues
 - Reviewed INCONEL and CrMo problems and developed additional guidance on joint preparation and welding technique
 - Enhanced technical content of pre-job briefings for welders
 - Reviewed welding problems with four outside welding contractors to gain benefit of their experience

Response to Field Problems

◆ Week of 8/19/96

- Revised pipe layout for 3” INCONEL nozzles to add spool piece allowing access for surface prep of the ID of the root pass
- Revised welding plan for remaining INCONEL nozzle welds
 - ▼ Changed to use of “slope control” welding machines
 - ▼ Instituted mock-up practice

Response to Field Problems

- ◆ **Week of 8/26/96**

- Brought in additional Duke and specialty welding contractors with INCONEL experience

- ◆ **Week of 9/2/96**

- Located different TIG filler material for CrMo pipe

Summary

- ◆ More problems occurred than anticipated with secondary welding
 - Recognized significance
 - Responded to correct weld process issues
 - Attacked reject issues using all available expertise and resources

NGD Welding Program Improvements

Tony McConnell

NGD Welding Program Improvements

- ◆ **Current State Program Deficiencies**
- ◆ **How Did This Happen?**
- ◆ **Corrective Action Plan**
- ◆ **Our Vision for the Future**
- ◆ **Sustaining High Quality**

Current State Program Deficiencies

- ◆ **Primary Deficiency**
 - Lack of overall welding program ownership

Current State Program Deficiencies

- ◆ Secondary Deficiencies
 - Unclear roles & responsibilities
 - Inconsistent processes and practices
 - Inadequate utilization of knowledgeable welding support personnel
 - Lack of recognition that welding skills had eroded
 - QA audits focused primarily on code/program compliance versus performance

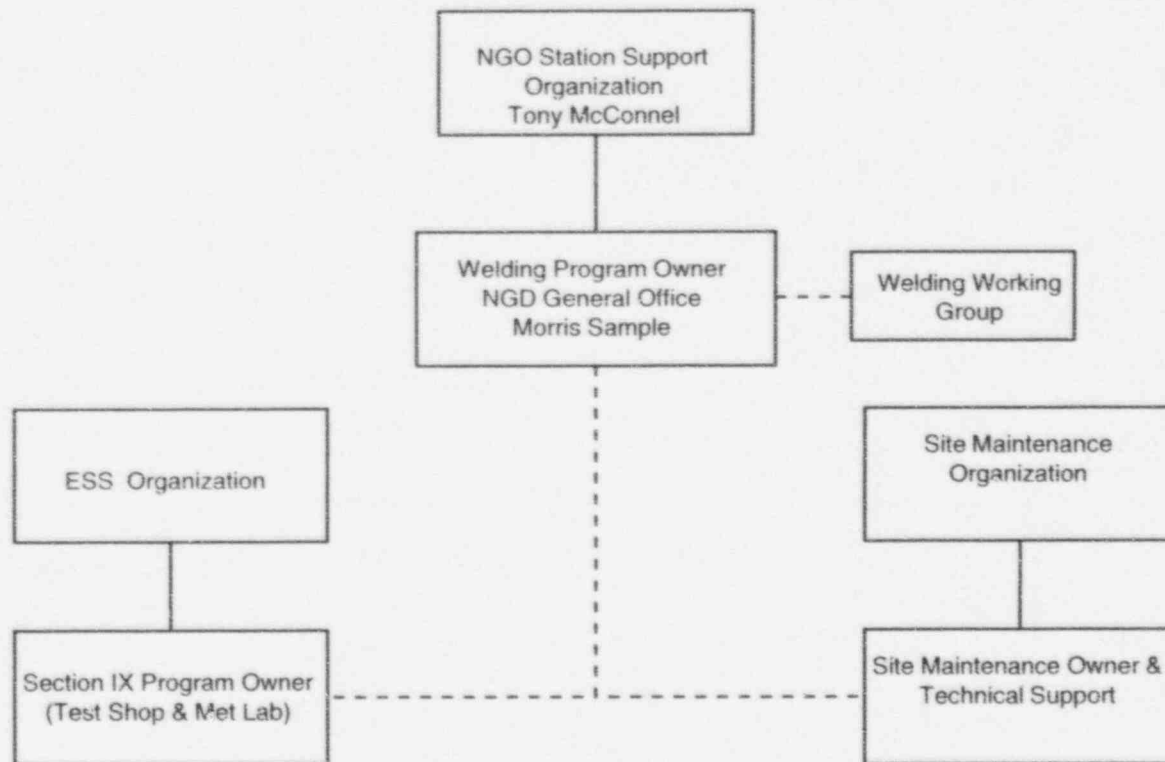
How Did This Happen?

- ◆ Reduced new construction coupled with multiple reorganizations resulted in inadequate attention to our welding program

Corrective Action Plan

- ◆ Establish Clear Program Ownership
 - Re-establish overall Departmental ownership by assigning a NGD lead

Welding Program Ownership



Key: - - - - Welding Program Interface
— Organizational Interface

Corrective Action Plan

- ◆ Establish Clear Roles & Responsibilities
 - Clarify site roles & responsibilities and strengthen site ownership
 - Document each organization's roles & responsibilities, the welding process and organizational interfaces in our Corporate and/or Departmental Welding Manuals

Corrective Action Plan

- ◆ Develop Consistent Processes
 - Consolidation of site welding manuals into a single departmental welding manual
 - Formation of a group at each site responsible for welding whose functions will include:
 - ▼ weldability/constructability reviews
 - ▼ mock-up training requirements
 - ▼ inspection requirements
 - ▼ review of rejected welds and repair decisions
 - Incorporation of more independent reviews into the procedure qualification process

Corrective Action Plan

- ◆ Assure utilization of qualified and knowledgeable personnel
 - Qualifications for performing technical support functions will be documented
 - Assessments will be performed for technical support personnel and training plans established to address any knowledge level weaknesses
 - Welding program and process training will be provided for all welders
 - All personnel performing visual inspections of non safety related B31.1 pressure piping welds will be trained to ASNT Level II or equivalent
 - QC Inspectors will be re-trained to ensure consistency of inspections

Corrective Action Plan

- ◆ Recognize that welding skills must be maintained
 - Will institute a limited access testing requirement for all process piping welders
 - Will require annual Jaegar eye exams for all process piping welders
 - Will ensure welder proficiency levels are maintained
 - High level welding expertise will be available via GO and ESS program owners for complex problem solving

Our Vision for the Future

Focused Program + Skilled Workforce = Quality Product

- ◆ Implementation of these corrective actions will strengthen our existing program to achieve this vision
- ◆ Significant corrective actions will be completed by mid 1997
- ◆ A transition team has been formed to implement corrective actions (Steve Sills is the Team Leader)

Sustaining High Quality

- ◆ Periodic self assessments will be performed to determine our welding program effectiveness
- ◆ The Welding Working Group will be the forum to identify continuous improvement efforts
- ◆ Key program indicators will be defined, tracked and trended

McGuire SGRP Plans

Ted McMeekin

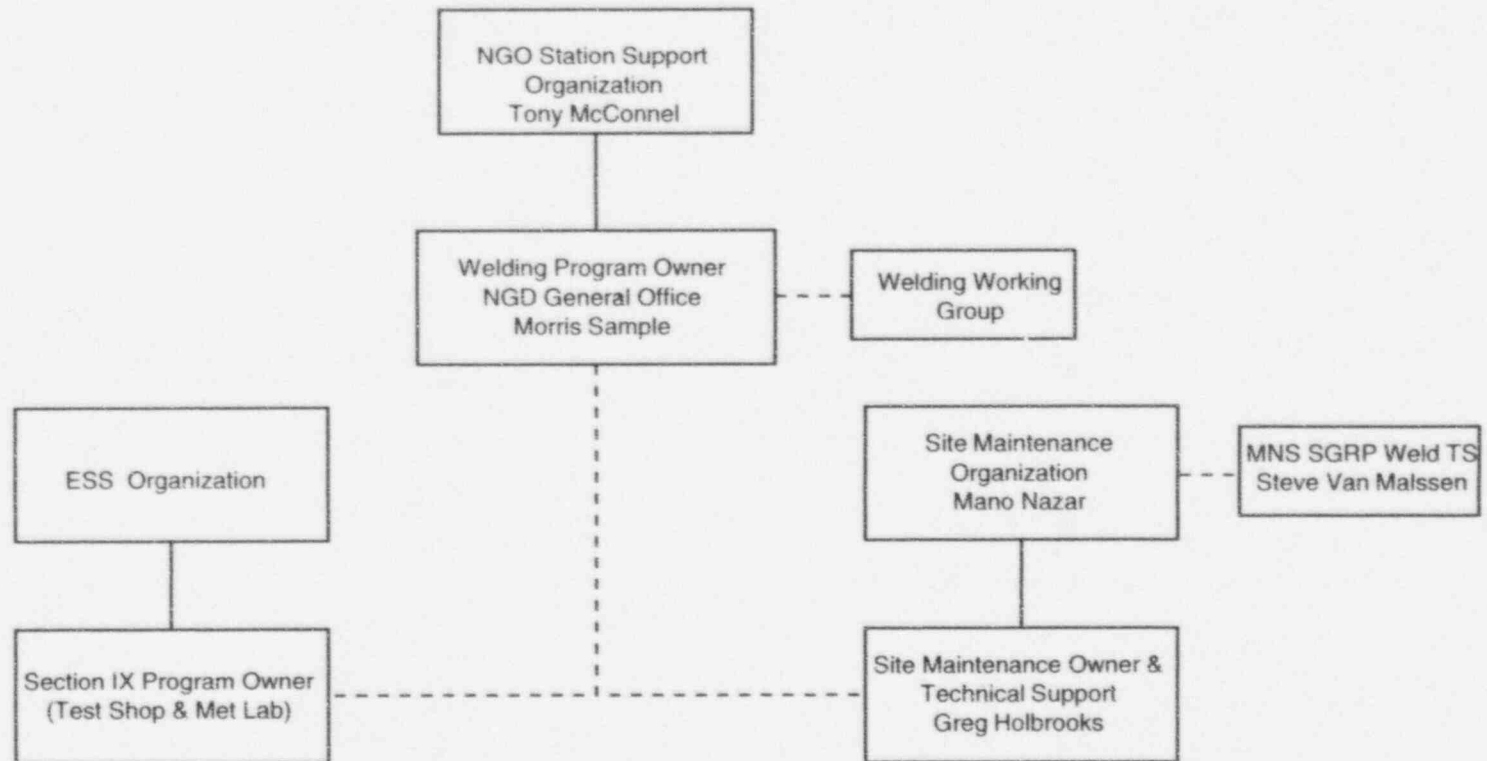
MNS SGRP Improvement Plan

- ◆ Alignment with Corporate Welding Initiatives
- ◆ MNS SGRP Welding Scope
- ◆ Weld Planning and Technical Support
- ◆ MNS SGRP Welding Direction
- ◆ Project Management Initiatives

Alignment with Corporate Welding Initiatives

- ◆ Corporate welding initiatives will be implemented by mid 1997
- ◆ Corporate welding initiatives that will be in place at MNS prior to 1EOC11
 - MNS Maintenance assigned ownership and responsibility for all site welding effective immediately
 - MNS welding manual revised to define changes specified by the Corporate Welding Initiative
 - Roles and responsibilities defined
 - Minimum qualifications listed

MNS Welding Program Organizational Interface



Key: - - - - Welding Program Interface
— Organizational Interface

MNS Welding Scope

- ◆ Primary System (Reactor Coolant)
 - MNS same as CNS scope
 - ▼8 NC Welds
- ◆ Secondary System (wet layup, blowdown, auxiliary feedwater, main feedwater, and main steam)
 - ▼Butt welds: 60-65 field & 60-65 shop
 - 25% reduction in field butt welds from CNS
 - ▼Socket welds: ~ 200 field & 200 shop

Weld Planning and Technical Support

- ◆ A detailed plan will be developed for each group of similar welds including:
 - ▼ Determination of best welding process (automatic, manual, TIG, etc)
 - ▼ Welder qualification and training requirements
 - ▼ Specify welders based on skill
 - ▼ Identification of appropriate welding filler materials
 - ▼ Approach to weld pre-heat and post weld heat treatment

Weld Planning and Technical Support

- ◆ To build this plan, the MNS SGRP has employed fulltime welding technical support to:
 - ▼ Provide leadership for detailed weld planning including material identification, equipment selection and specification, and training related issues
 - ▼ Provide technical assistance and execution support to SGRP on all welding issues and adjust plan as required
 - ▼ Serve as main link between SGRP and Station Welding Owner
 - ▼ Provide guidance for continuous improvement to welding plan, lessons learned process, and preparation for next SGR outage

MNS SGRP Welding Direction

▼Primary System Welds

- Narrow gap automated process
(same as CNS)**
- Will utilize the same vendor
(FTI)**

MNS SGRP Welding Direction

◆Secondary System Welds

- ▼Use automated technology to extent practical
- ▼Use internal workforce to support both automated and manual welding
- ▼Employ outside technical expertise to support automation
- ▼Perform nozzle to process pipe dissimilar welds as part of SG prep activities
- ▼Use resistance heating for all pre-heat requirements

MNS SGRP Welding Direction

- ◆ Execution Workforce Training
 - ▼ Limited access welding test for welders assigned to pressure piping
 - ▼ Provide detailed hands-on and classroom training for new equipment, material, or process changes
 - ▼ Perform mock-up training to evaluate technique, skill level, and proficiency of workforce
 - ▼ Provide detailed, technical guidance and instruction in pre-job briefs
 - ▼ Perform Jaegar eye exams for all process piping welders
 - ▼ QC inspectors will undergo refresher training to ensure consistency

Project Management Initiatives

- ◆ NSD 604, stop work directive will be emphasized to all SGRP and associated station groups
- ◆ Establish clear success criteria for welding and contingency plans should problems occur
- ◆ Perform independent assessment of MNS SGRP welding plan

Summary

- ◆ Improve corporate welding program
- ◆ Develop detailed MNS welding plan
- ◆ Perform independent assessment of MNS welding plan
- ◆ As a result of Catawba's experience we anticipate a smooth and predictable SGRP at McGuire
 - We do not take Catawba's experience for granted