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VICE PRESIDENT
NUCLEAR PRODUCTION

TELEPHONE
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May 3, 1985

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Subject: McGuire Nuclear Station
Docket Nos. 50-369 and 50-370

Dear Mr. Denton:

By letter dated March 1, 1985, NRC transmitted the Detailed Control Room Design Review Supplemental Safety Evaluation Report #2 for McGuire Nuclear Station, NRC requested that Duke address the implementation schedule and HED M-1-0152. The detailed responses to both of these items are provided in the attached.

With respect to implementation schedule, Duke has provided a substantial discussion of the factors utilized in developing the Duke HED implementation plan. Consideration of such factors is essential to the development of an effective integrated operating plan and to facilitate the proper perspective of individual components of the plan. If the discussions provided herein are insufficient to resolve this item, Duke would be pleased to host a visit by NRC staff (and consultants) to observe first hand the activities involved at Duke In the area of HED modification implementation. Duke initiated activities in the detailed Control Room Design Review effort one-year prior to NRC issuance of Generic Letter 82-33. The summary report of the results of this review was submitted within approximately 14 months of the issuance of this Generic Letter. Throughout this entire effort, Duke has been aggressive in completing the identified activities within reasonable time periods. To our knowledge, no other utility is as far along in completion of these activities as is Duke. Duke requests that NRC consider the total period of time from the initiation of the review to the completion of all HED modifications in evaluating the acceptability of the Duke implementation plan. We also request that NRC consider other plant modifications already planned as well as the plant modification process itself. As indicated in the information provided in the attached, the modification process itself is an extremely complex process and bears heavily on the number of modifications that can be processed prior to a refueling outage.

With respect to HED M-1-0152, additional information is provided in the attached. Duke considers that the recommendation to leave the item "as-is" remains valid. Unless the staff directs otherwise, Duke does not plan to implement any change in this instance.

A003
1/1

Very truly yours,

Hal B. Tucker

Hal B. Tucker

RLG/mjf

Attachments

cc: Dr. J. Nelson Grace, Regional Administrator
U. S. Nuclear Regulatory Commission
Suite 2900
101 Marietta Street, NW
Atlanta, Georgia 30323

Mr. W. T. Orders
NRC Resident Inspector
McGuire Nuclear Station

Mr. Darl Hood
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Regulatory Commission
Washington, D. C. 20555

DUKE POWER COMPANY

MCGUIRE NUCLEAR STATION

Response to Control Room Design Review Supplemental SER #1

NRC Letter Dated March 1, 1985

1. INTRODUCTION

The following discussions are provided to NRC as additional information in support of the Duke plan for implementation of HED's identified during the detailed Control Room Design Review (CRDR). As a bit of history, Table 1 is provided to show the milestones that had been accomplished by Duke on McGuire in this effort. It is noted that Duke efforts started well before NRC issued Generic Letter 82-33, Supplement 1 to NUREG-0737.

At present, there are two open items with respect to McGuire CRDR. The first is associated with HED M-1-0152; the second is associated with the Duke planned implementation schedule. Both of these will be discussed in later sections of this report. However, the following comments are provided regarding NRC suggested implementation schedule.

Following the TMI event in 1979, licensees were required to implement numerous plant modifications on expedited schedules to meet arbitrarily imposed deadlines. At the time, the impact of this was not appreciated. However, by the time Generic Letter 82-33 was issued, NRC had recognized there was need to consider plant unique situations in establishing schedules. NRC states in the Generic Letter:

> Based on discussions with licensees, the staff has learned that many of the Commission approved schedules for emergency response facilities probably will not be met. In recognition of this fact and the difficulty of implementing generic deadlines, plant-specific schedules will be established which take into account the unique status of each plant.

With this statement, NRC had taken a major step away from establishing arbitrary completion dates and towards realistic, flexible implementation schedules taking into account plant specific factors.

In the issue at hand, and contrary to the above, NRC is reversing itself and essentially requiring the implementation of all HED modifications by the completion of the 1986 refueling outages of each McGuire unit. Further, in order for Duke, or any licensee for that matter, to extend the implementation schedule beyond the NRC suggested completion date, rigorous justifications are required. It is noted that this requirement for extensive justification is derived from Standard Review Plan Section 18.1 which is beyond the original requirements of NUREG-0737, Supplement 1; is prepared solely as guidance to NRC staff; and was issued well after Duke provided the HED implementation schedule (March 1984) and initiated Control Room modifications on McGuire 1 (Feb-May 1984). Duke strongly feels that the NRC plan overestimates the overall safety significance of each HED and underestimates the effort and flexibility needed by licensees to effect modifications on a timely basis. The Duke plan places both of these areas in proper perspective and is wholly responsive to the NRC statement in Generic Letter 82-33. Additional detailed discussion of the implementation plan is covered in Section 3 of this report.

2. DISCUSSION OF HED M-1-0152

NRC staff does not agree with Duke's recommendation regarding HED M-1-0152. For convenience the complete concern is repeated as well as the Duke response.

TER, page 2, Item 2

HEDs Proposed to be left Uncorrected

For the 10 HEDs that Duke Power has provided further justification or clarification to leave uncorrected, we (NRC) conclude that Duke's justifications for the following nine HEDs are satisfactory:

HED NO.			
	M-1-0028	M-1-0269B	
	M-1-0038	M-1-0563	
	M-1-0118	M-1-0654	TER, pages 24-26
	M-1-0159	M-1-0669	Section 3
	M-1-0268		

Duke's justification for leaving HED No. 1 M-1-0152 uncorrected is unsatisfactory for the following reasons:

HED no. M-1-0152: The justification for not correcting this HED is discussed in two places in the Duke Power Company response. Contradictory justifications are presented for use of key-operated switches by Duke. The staff does not agree with the justification presented by Duke Power which leaves the Pressurizer PORV as a key-operated switch for the following reasons:

1. The Westinghouse Owners Group generic studies show a time-dependent reliance on the pressurizer PORV to mitigate a SGTR. In addition,

the pressurizer PORV which provides low temperature overpressure protection may be required on a timely basis in forced shutdown situations as documented in McGuire's FSAR and its Supplements.

2. No protection is required for security reasons (See NUREG-0700, Guideline 6.4.4.3.a).

3. Key-operated switches should not be used solely as a means of shape coding (See NUREG-0700, Guideline 6.4.4.3.1).

Duke Response:

HED M-1-0152 concerns several keylock switches which are being replaced by non-keylock switches. This HED resulted from the Operating Experience Review. Operators were concerned with the inconvenience of using keylock switches when these switches are under the Operator's direct control and no security is needed for protection from use by unauthorized personnel. In solving this HED, the Review Team reviewed all keylock switches in the control room that are under the operator's direct control and proposed to replace all but three of these switches with non-keylock switches. This replacement is consistent with NUREG-0700 guidelines which state in 6.4.4.3a "if key-operated controls cannot be justified in terms of security, they are probably not necessary and should not be used".

Justification for the three switches proposed not to be replaced was included under Appendix C, HEDs Not Corrected, the Duke DCRDR response (page C.4, Section 3.4, Response to Supplement 1, NUREG-0737). Justification 2 concerns the switch in question. This switch is the

mode selector switch for selecting the operating mode and setpoint for the Pressurizer Power Operated Relief Valves (PORV).

This switch is placed in the "low pressure" mode during plant startup and shutdown, and provides a low pressure setpoint, interlocked with reactor coolant temperature, to actuate the PORVs. The protection provided in the low pressure mode is for periods of water solid operation. The PORV low pressure setpoint is enabled by the operator as plant conditions dictate during startup and shutdown.

As RCS temperature approaches the temperature setpoint during plant cooldown but before collapse of the pressurizer steam bubble, an annunciator alerts the operator that plant conditions require low temperature overpressure protection. The operator places each key-lock switch to the LOW PRESSURE position to enable the PORV low pressure setpoint.

When system temperature rises above the temperature setpoint during plant heatup, the RCS Overpressure Protection System is automatically disarmed, and an annunciator alerts the operator that low temperature overpressure protection is no longer required. The operator then returns each key-lock switch to the NORMAL position.

While the operation of this switch is dependent upon plant conditions, its use is not a time critical, fast response operation.

The Pressurizer PORV control switches, as well as the Pressurizer PORV Block Valve control switches, are not keylock switches and are always immediately available for operator use. These switches are used to mitigate an SGTR as shown in the Westinghouse Owners Group generic task analysis (tasks E30.3 and E40.3). There is no reliance upon the mode selector switch in this event.

The Review Team concluded that it was not cost-effective nor did it provide any particular benefit to replace this switch for the following reasons:

(1) the mode selector switch is not used in a time critical, fast response operation, nor is it used for emergency response

(2) the PORV and PORV Block Valve control switches are available for operator response when required

(3) while the keylock feature is not required for security purposes, it does effectively shape code this switch from the adjacent PORV and PORV Block Valve switches

(4) while keylock switches should not be used solely for shape coding (NUREG-0700, 6.4.4.3.a), in this instance the use of a keylock switch is a very minor HED and, in addition, with the key remaining in the switch (since there is no security requirement), the switch is effectively a non-key rotary switch.

In consideration of the above, Duke believes that a change is neither desirable or essential.

3. DISCUSSION OF DUKE HED IMPLEMENTATION PLAN

The HED Implementation Plan is the last phase of an extensive Duke effort to conduct the McGuire CRDR. The staff has reviewed this entire effort and has found that all other requirements of NUREG-0737, Supplement 1 have been met with the schedule for HED corrective action being the one exception. (Assuming HED M-1-0152 is adequately resolved by this submittal). In developing the implementation plan, Duke utilized those personnel with expertise that had been relied upon in the early phases of CRDR and which the staff had stated met the requirements. Two broad areas were considered in development of the implementation plan.

The first broad area included factors associated with HED modifications themselves. Following the completion of Control Room Review (CRR) on November 1, 1983, work began immediately to implement modifications on McGuire Unit 1. The design, equipment procurement, and implementation of 22 HEDs were completed as scheduled in the first refueling outage beginning February 26, 1984 --- 3½ months after Control Room Review completion. These HED modifications included nameplates, mimic additions, meter scale revisions, switch modifications, and the re-arrangement of several control board panels. Factors considered in selecting these HEDs were CRR priorization, design lead time, equipment procurement lead time, and integration with the work already scheduled for the outage 1 - 2 years in advance of the outage date.

After the completion of the first McGuire 1 outage, Duke began planning and scheduling work for the second outage for Unit 1, identifying the work which could possibly be done on-line and providing those designs to the station as soon as reasonably possible. Physical modifications planned for the second outage included meter scales, switch modifications, the addition of narrow range containment pressure indication, additional valve controls, removal of unnecessary controls from the control room, and the re-arrangement of devices on control boards 1MC9, 10, 11, and 13. Again, factors considered in selecting these modifications for improvement included CRR priorization, operating procedure revisions, training necessary to support the modifications, instrument calibration and IAE procedure changes, design and equipment lead-times, and the similar efforts proceeding in parallel on McGuire Unit 2.

Duke's commitment for the second Unit 1 refueling outage is 45 HED modifications. Presently 55 HED modifications have been designed and scheduled for implementation. It is our goal to install as many of these modifications as possible and to exceed the commitment of 45 if possible. However, it has been our experience that equipment deliveries, physical constraints to implementation, operating conditio[illegible]ich limit circuit modifications, or unscheduled equipment repairs may impact the number of modifications we are able to install during an outage. If we are successful in meeting our goal of 55 HED modifications, Duke Power will have completed 51% of the total HEDs committed to be resolved in the time frame of one fuel cycle. This 51% includes over 90% of the Paint, Tape, Label (PTL) HED modifications.

The remaining HED modifications scheduled for the next two refueling outages include a large number of meter scale revisions (ranging from label enhancements to scale/range revisions), the addition of controls/displays useful to the operator but not safety significant, the rearrangements of 1MC2 control board and the HVAC control board, minor re-arrangements to control boards 1MC1 and 1MC13, auxiliary shutdown panel modifications, and the relocation of annunciator tiles. Again these modification are scheduled consistent with CRR priorization recommendations, planned for minimum impact to operating procedures and operator training, and scheduled with the best utilization of Duke Power design and construction resources. These modification schedules take into account prioritization of HED modifications versus other modifications and also take into account the fact that our manpower resources are distributed over seven nuclear power units.

Table 2 shows the HED modification plan for Unit 1. The table lists the HEDs in ten categories: nameplates, meter scales, switch modifications, recorder modifications, equipment additions, equipment deletions, control board component re-arrangements, auxiliary shutdown panel modifications, miscellaneous, and annunciator modifications. Explanations of these categories are contained as a footnote to Table 2.

With respect to McGuire Unit 2, the first outage commitment is 47 HEDs. Our goal is to exceed the commitment unless hampered by unexpected problems as discussed with Unit 1. Comparing the Unit 2 first outage modification to the second outage of Unit 1, three points are noted:

1. Over 70% of the nameplate modifications are planned for completion by the end of the first outage;

2. Compared to the Unit 1 first refueling, a larger group of control board re-arrangements are planned for Unit 2 in an effort to keep the modifications synchronized for the 2 units; and,

3. Most of the Unit 2 HED modifications to resolve the minor differences between the two units are planned for the first Unit 2 refueling outage.

Work is proceeding to schedule remaining Unit 2 modifications over the next three outages to meet or exceed our NRC commitments and to keep Unit 2 modifications in step with the Unit 1 progress. Table 3 shows the HED modification plan for Unit 2. The table lists the HEDs in the same ten categories as provided for Unit 1. As can be seen from the preceding, Duke has been aggressive in implementing identified HED improvements. It is estimated that 350,000 man-hours will be expended on this effort for McGuire alone. It is also noted that several were implemented prior to the submittal of the Summary Report and many more designs completed and implementation started even before NRC issued its SER and Supplement.

Summarizing, HED modifications are scheduled for implementation in a priorization order recommended by the CRR Team which was developed by a consensus of opinion representing human factors engineering, operating, and engineering disciplines. Their consensus of opinion considered the importance of each HED to plant operation, design lead time, equipment

lead time, limiting operating conditions during the outage, and the resources available during an outage to accomplish these modifications. Of equal importance in the decision process was the objective to minimize the negative impact of these changes to the operator.

The Duke Power Control Room Review has demonstrated a strong commitment to strengthen the man-machine interface in the control room. Our control room review found no HED so significant that it required immediate resolution or that it should cause a delay in plant operations. The implementation schedule proposed by the Control Room Review Team integrated with other improvements scheduled such as EOP Upgrade, SPDS, PAM, and other regulatory actions, is reasonable and allows for the proper flexibility to be achieved.

While the NRC would have each HED reviewed against four factors and supplied with a numerical estimate to be used to determine relative significance, Duke submits that such an effort is not supported by the perceived benefit as all outstanding HED modifications are of minimal significance, especially when compared to other planned plant modifications. Such an effort would be of even less benefit when applied to the small number of HEDs expected to be installed following the 1986 refueling outages.

The second major area considered by Duke in the development of the HED implementation plan includes other plant modifications and the modification process itself.

There is approximately a 1-2 year lead time required to perform all the necessary actions in order to implement any modification in a plant. Certain critical modifications can be made on an expedited basis but such is not the case here. The number of regulatory related modifications planned for current and future outages is substantial. The total scope of modifications for 1986 refueling outages has already been fairly well set as have major activities. Table 4 summarizes the extent of planned modifications. Each modification must go through a rigorous process before it can be implemented. Even apparently simple modifications must be thoroughly reviewed.

A copy of the modification process flow chart is provided for information to assist in understanding the complexity of the modification process. Also attached, for informational purposes only, is a copy of the implementation plan which must be developed for each NSM by its Accountable Engineer. Please note that this 11 page plan is but a small part of the modification process flow chart.

Based on the thorough understanding of the relevant factors presented above, Duke has concluded that the implementation plan presented is both reasonable and effective.

4. CONCLUSIONS

Duke has provided a firm commitment to complete all outstanding HED's on a reasonable schedule. This schedule is realistic, achievable and takes into consideration many factors. Duke has also demonstrated the ability to meet and even exceed commitments made thus far. However, even in the

best of plans, problems and delays can arise on individual improvements without compromising the effectiveness of the overall plan. Licensees should be allowed the flexibility to accommodate potential delays, and not be required to comply with arbitrary generic deadlines, and explicit schedules for implementation of each HED. None of the outstanding HED's are of such a significance as to require a forced plant shutdown to implement or to require the extension of an outage to complete. Although from a regulatory perspective the establishment of an arbitrary completion date is effective, it is unrealistic in that it does not take into account the complexities of the modification process nor the relative insignificance of the effect of HED modifications yet to be installed.

Table 1

McGuire

Control Room Design Review

Milestone Schedule

Steering Committee Appointment	11/81
Program Concept	01/82
Review Team Selected	02/82
Final Draft of Review Plan	05/82
Plan Presentation to NRC	05/82
BioTechnology Hired for Human Factor Assistance	06/82
Final Duke/BTI Workplan	08/82
Commence Review Activities	09/82
Generic Letter 82-33, Supplement 1 to NUREG-0737	12/82
Duke Plan in Response to GL 82-33	04/83
Complete Review Activities	05/83
Complete Assessment of Review Results	08/83
CRDR Summary Report to NRC	02/84
CRDR Implementation Schedule	03/84

Table 2

McGuire Unit 1

First Refueling Outage (Completed HED's)

Nameplates Mimic Labels	Meter Scales	Switch Modific Labels	Recorder Mods	Equip. Add.	Equip. Deletions	CB Rearrange	ASP	Misc.	Ann.
415	075	001	407	564		129			
492	104	016	486			139			
493	107	114				269A			
494	176	356				672			
512	286								
	666								

Second Refueling Outage (Planned HED's)

066	121		020	616		219	580	700	
068	714	184	054		108	681	610C		
077					117	687			
078					132	691			
096		337	656		141	695			
097		343B			142				
102		343C			149				
103		344			183				
106		359			268C				
127					513				
172		491			514				
189		565			565				
307									
308									
309									
311									
322									
333									
375									
488									
671									
683									

Third and Fourth Refueling Outages (Planned HED's)

111	070	699	003	179	272	376	615	610A	004
430	138	152	292	403B	675	522	682	403C	018
	177	354	678	190		105	689	652	679
	198	363		034		517	698	693	
	274	124		194		587	686		
	281	258		665		520	688		
	282	331		664		188	694		
	283	361		482		657	703		
	285					676			
	287								
	288			128					
	313			192					
	324								
	327								
	370								
	374								
	487								
	489								
	609								
	653								
	690								
	186								
	45								

Table 3

McGuire Unit 2

First Refueling Outage (Planned HED's)

Nameplates Mimic Labels	Meter Scales	Switch Modific Labels	Recorder Mods	Equip. Add.	Equip. Deletions	CB Rearrange	ASP	Misc.	Ann.
415	075	001	407	020	616	129	2-222	610C	700
494	176	016	486	2-336		139			
066	666	114		564		269A			
068	714	356				672			
077		184				117			
078		565				132			
096		2-325							
097						149			
102						268C			
103						514			
106						2-318			
127						2-319			
172						2-322			
189						2-323			
308									
311									
322									
375									
488									
671									
2-308									
309									
333									

McGuire Unit 2

Remaining Three Outages (Planned HED's)

Nameplates Mimic Labels	Meter Scales	Switch Modific Labels	Recorder Mods	Equip. Add.	Equip. Deletions	CB Rearrange	ASP	Misc.	Ann.
	104		003	054	272	105			004
	107	124	292	128	675	108	681	610A	018
	286	258	678	192		142	687	403C	679
307	121	331	2-314	656		183	691	652	
	070	337		179		513	695	693	
	138	343B		403B		516	615		
683	177	343C		190		376	682		
111	198	344		034		522	689		
430	274	359		194		517			
	281	361		665		587	686		
	282	491		664		520	688		
	283	699		482		188	694		
	285	152				657	698		
	287	354				676	2-457		
	288	363		2-315					
	313	2-313				2-330			
	324					2-331			
	327					141			
	370								
	374								
	487								
	489								
	609								
	653								
	690								
	186								
	45								
	2-309								

Table 2

Footnotes

Nameplates mimic labels: Nameplates, demarcation lines, mimic lines, etc.; engraved plastic pieces attached to the control boards by screws.

Meter scales: Modifications made to meter scales including changing the range which will require transmitter calibration, replacement or square root extractors to linearize; changes to the scale graduations, numbers displayed, title of the parameter being measured (e.g., volts in lieu of V), addition of red abnormal range markings, changing Roman numerals to Arabic numerals indicating channels, etc. All of the above changes require that the meter be removed from service, removed from the board and disassembled.

Switch modifications: Labels, changing switch lens (colors, abbreviations, arrangements), changing switch functions, changing the rotation (i.e., auto-on-off to on-auto-off), changing the escutcheon around the switch indicating switch function. All of the above changes require taking the switch out of service, removal from the board, in some cases disassembly, and in some cases wiring changes.

Recorder modifications: Change pen functions, pen arrangement, pen colors, recorder labels, paper type.

Equipment additions: Add meters, switches, controllers, displays, recorders. All involve cutting the board, painting, wiring.

Equipment deletions: Delete meters, switches, controllers, displays, recorders. All involve wiring, patching and painting the board.

Control board rearrangements: Range from swapping one device with another on the same board or changing devices from one board to another, to complete removal of all devices from a board, patching the board, cutting new cut-outs, painting and rewiring the arrangement.

ASP: Changes to the auxiliary shutdown panel including nameplates, switch modifications, meter changes, device addition/deletion, and rearrangements.

Miscellaneous (Misc): Lighting, covering holes in the concrete, etc.

Annunciator (Ann): Changes to the annunciators and status lights including the rearrangement of files, addition and deletion of signals. This is a significant modification to the Control Room involving new cables and wiring changes.

Table 4

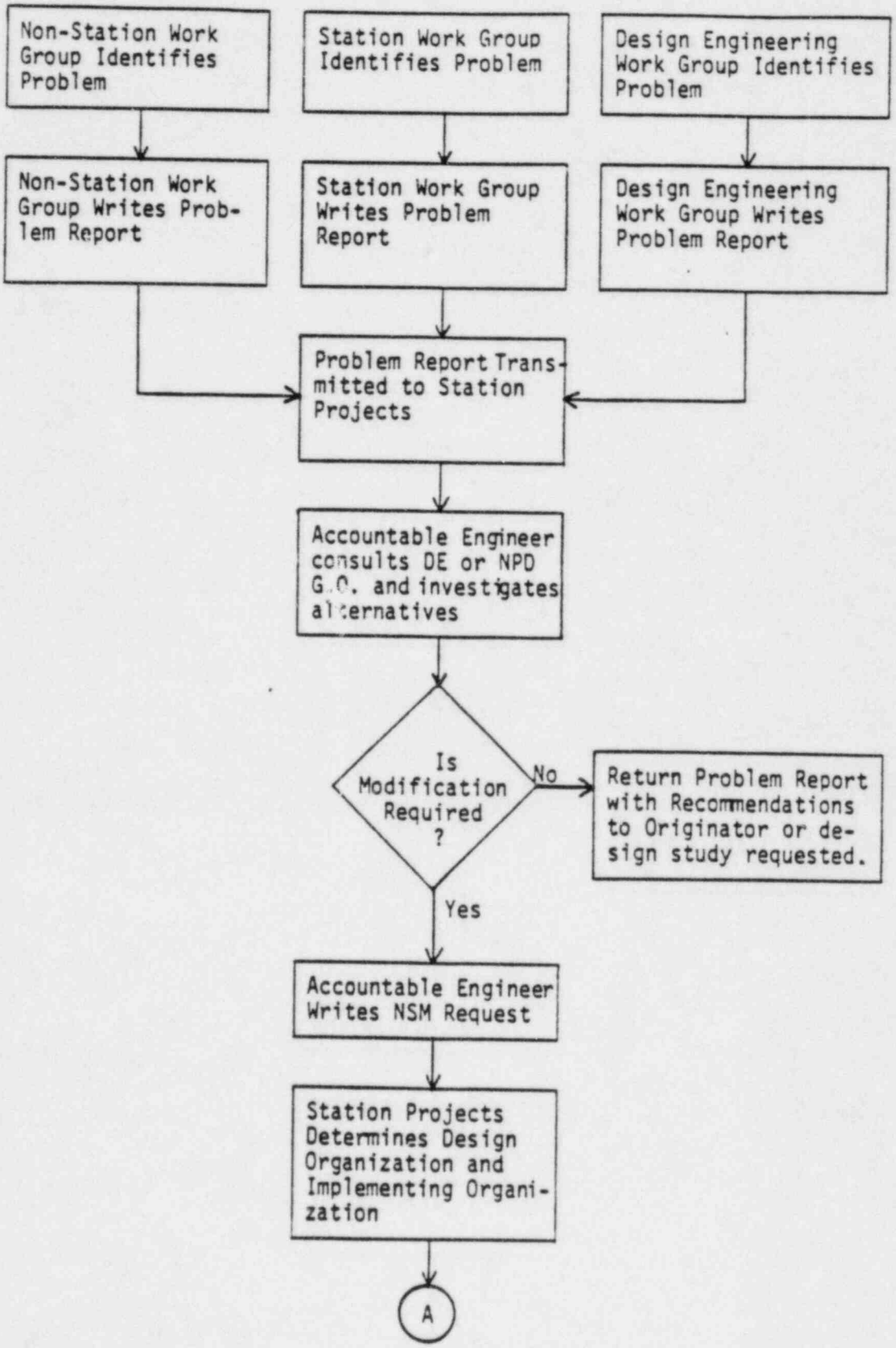
McGuire Nuclear Station

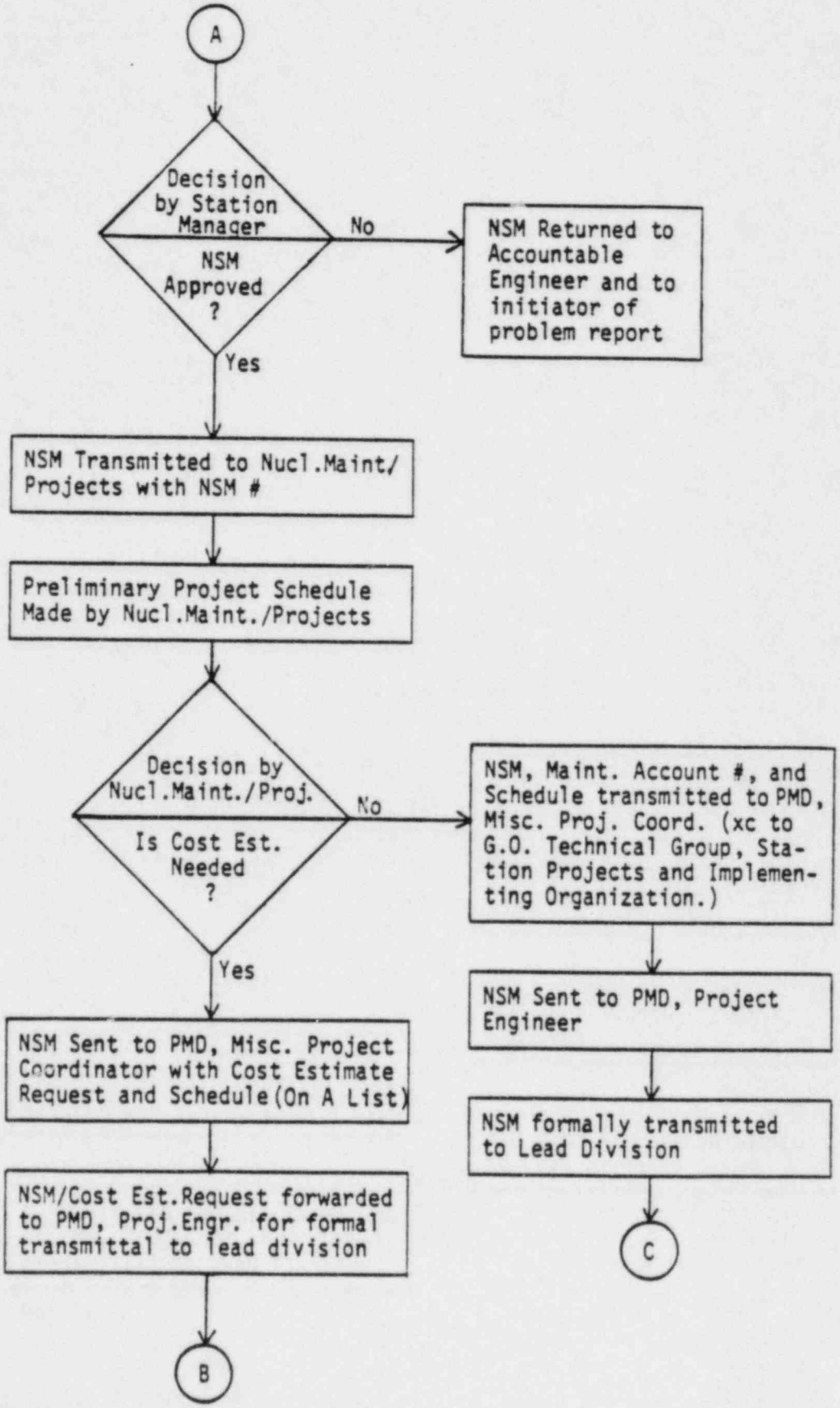
Modifications

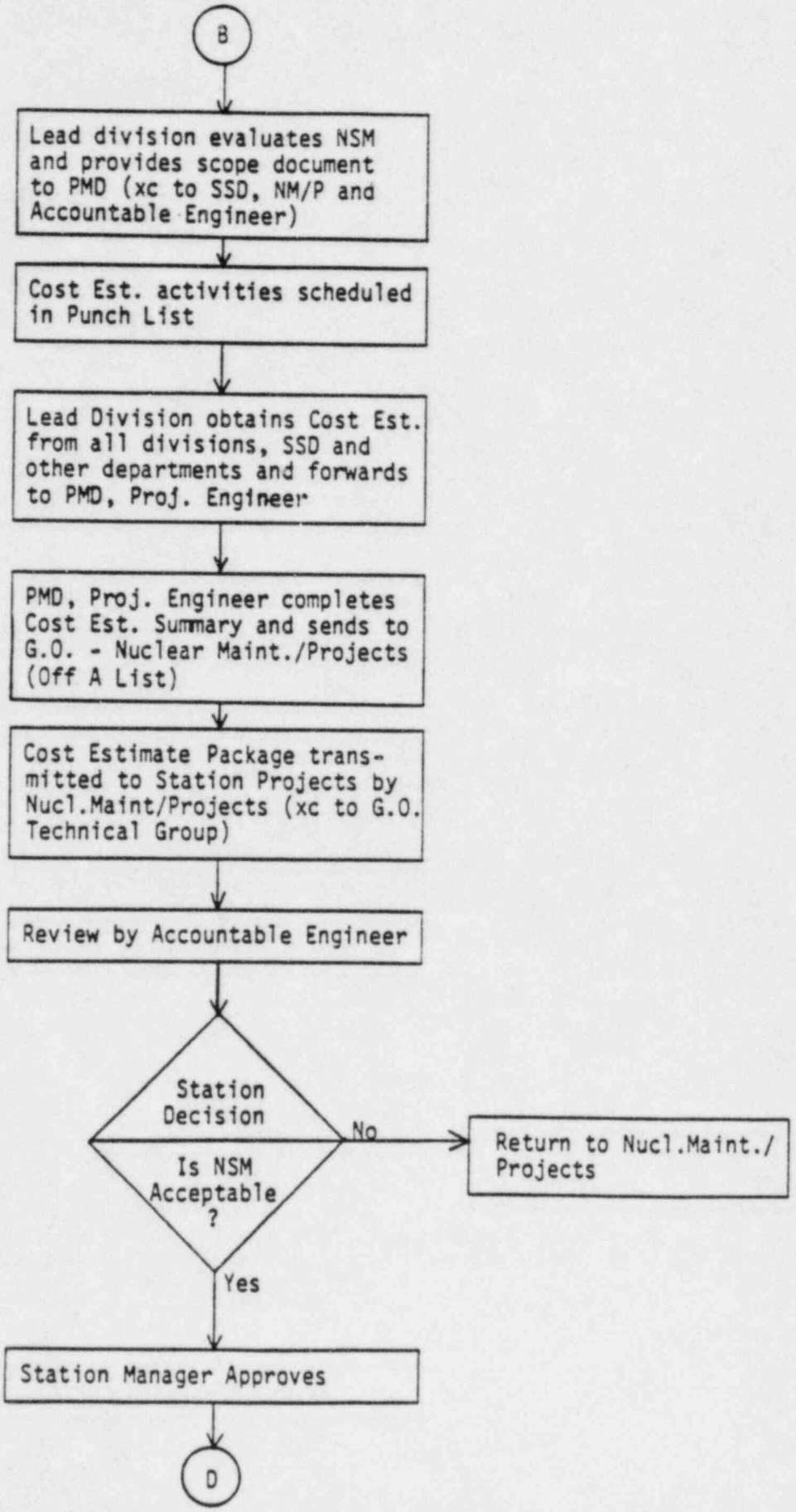
- 65 CRDR NSM's were originally written for Unit 1.
- 71 CRDR NSM's were originally written for Unit 2.
- The remaining CRDR NSM's constitute approximately 15% of the open NSM's on MNS.
- Regulatory required NSM's constitute approximately 25% of the open NSM's on MNS.
- 43 of 97 (44%) of the NSM's planned for Unit 2's 1985 refueling outage (EOC 1) are regulatory requirements.
- 23 of 76 (30%) of the NSM's planned for Unit 1's 1985 refueling outage (EOC 2) are regulatory requirements.
- 36 of 69 (52%) of the NSM's planned for Unit 2's 1986 refueling outage (EOC 2) are regulatory requirements.
- 39 of 80 (49%) of the NSM's planned for Unit 1's 1986 refueling outage (EOC 3) are regulatory requirements.
- 1986 Refueling Outage Major Modifications
    - Control Room Design Review Hardware Modifications
    - RG 1.97 Modifications
    - Upgrade Incore T/C

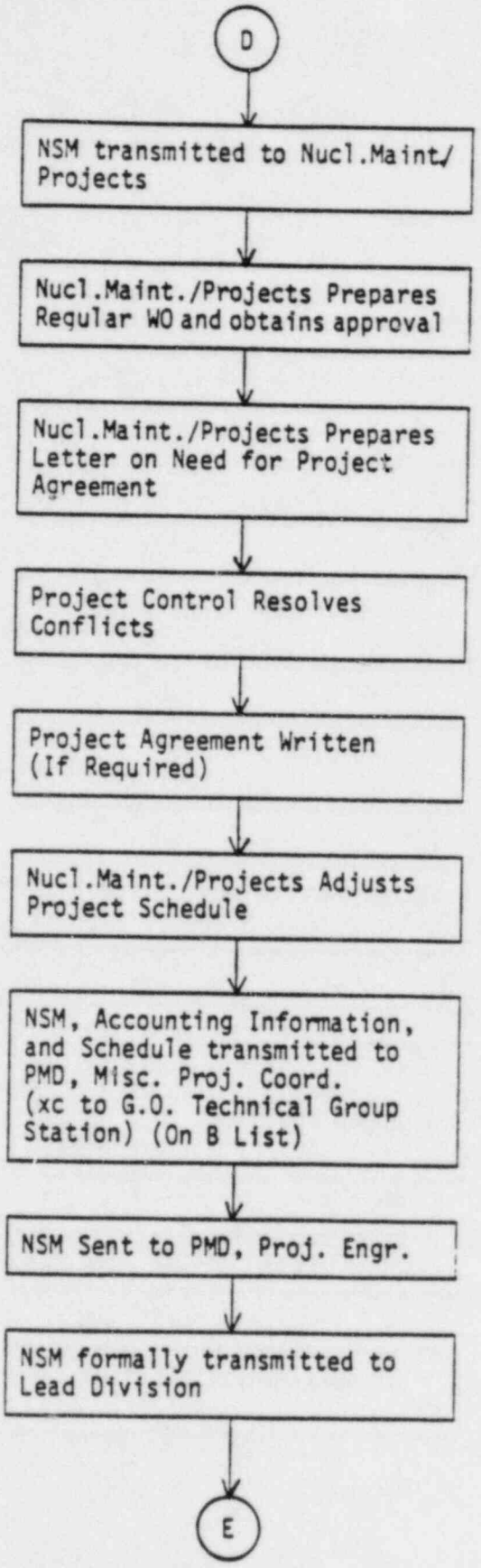
NSM = Nuclear Station Modification

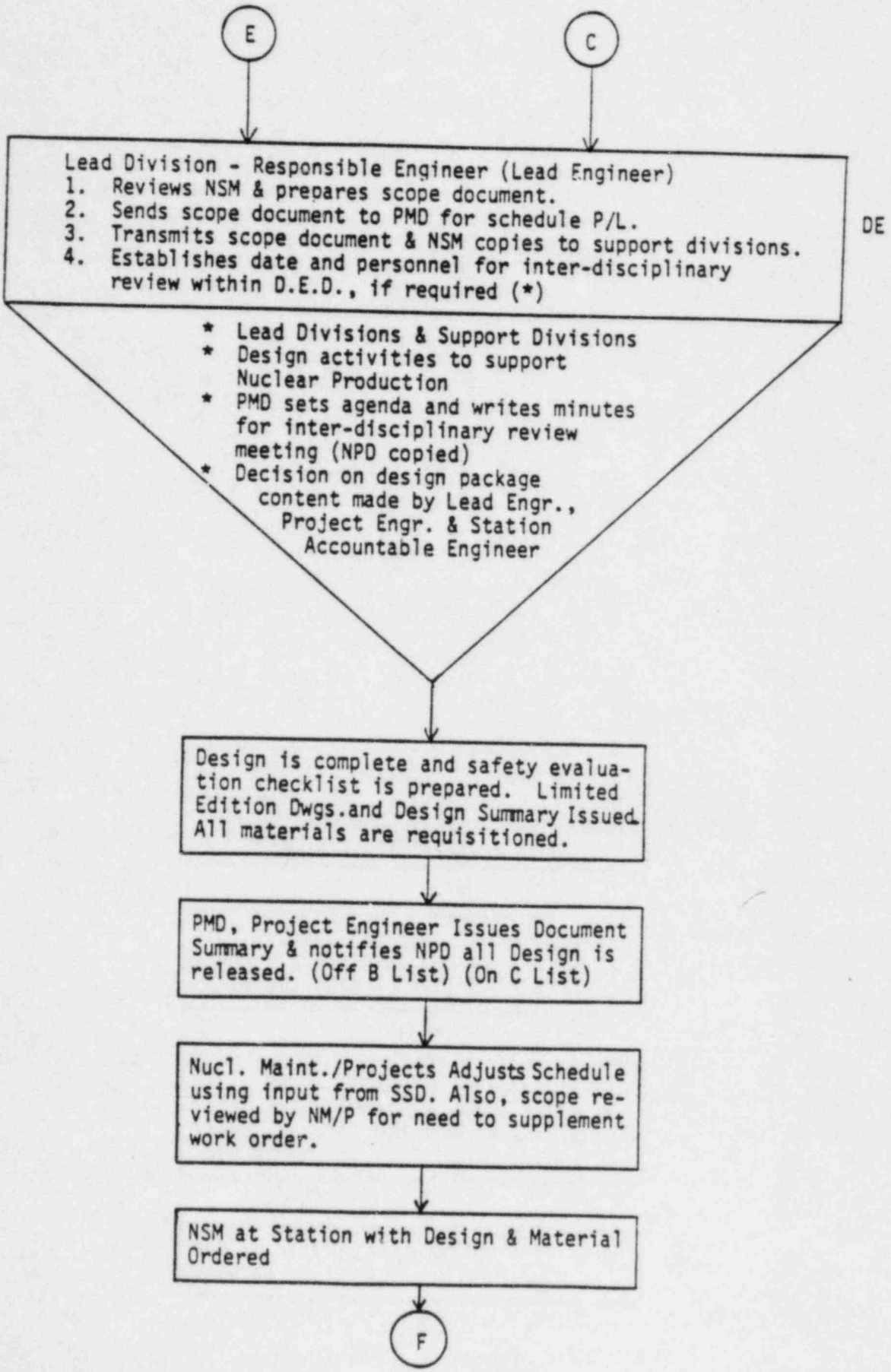
4.2.1 Process Flow Chart for Design Engineering Designed Modifications (using limited edition drawings)

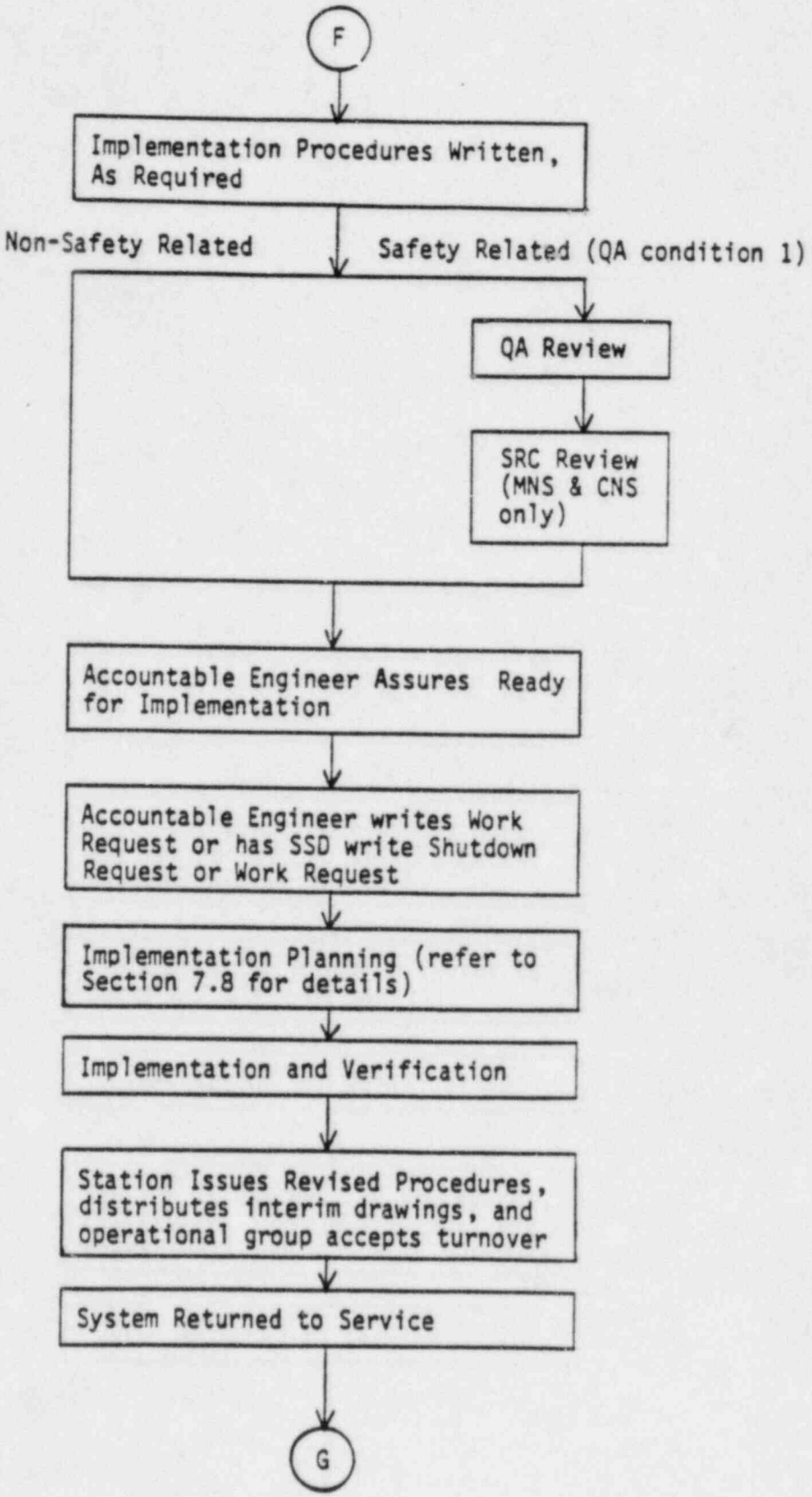


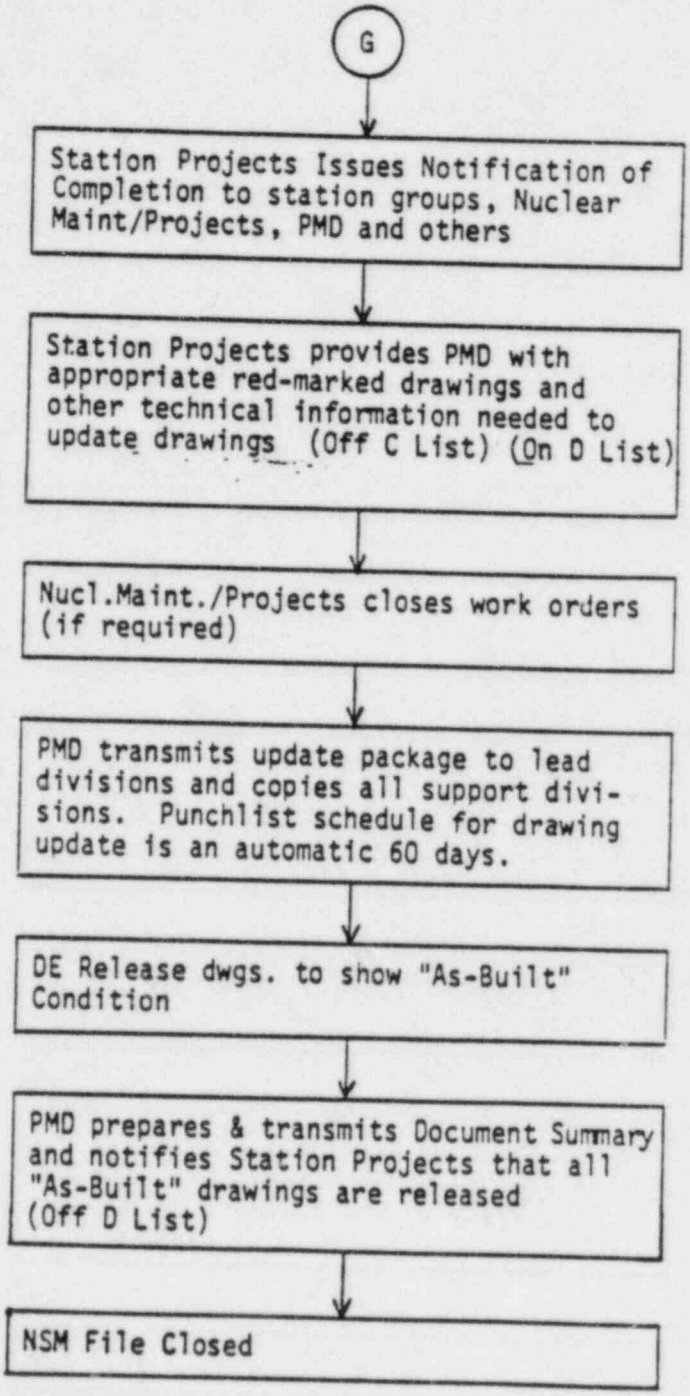

A
Decision by Station Manager
NSM Approved ?
No
NSM Returned to Accountable Engineer and to initiator of problem report
Yes
NSM Transmitted to Nucl.Maint/ Projects with NSM #
Preliminary Project Schedule Made by Nucl.Maint./Projects
Decision by Nucl.Maint./Proj.
Is Cost Est. Needed ?
No
NSM, Maint. Account #, and Schedule transmitted to PMD, Misc. Proj. Coord. (xc to G.O. Technical Group, Station Projects and Implementing Organization.)
Yes
NSM Sent to PMD, Misc. Project Coordinator with Cost Estimate Request and Schedule (On A List)
NSM Sent to PMD, Project Engineer
NSM formally transmitted to Lead Division
NSM/Cost Est.Request forwarded to PMD, Proj.Engr. for formal transmittal to lead division
C
B


B
Lead division evaluates NSM and provides scope document to PMD (xc to SSD, NM/P and Accountable Engineer)
Cost Est. activities scheduled in Punch List
Lead Division obtains Cost Est. from all divisions, SSD and other departments and forwards to PMD, Proj. Engineer
PMD, Proj. Engineer completes Cost Est. Summary and sends to G.O. - Nuclear Maint./Projects (Off A List)
Cost Estimate Package transmitted to Station Projects by Nucl.Maint/Projects (xc to G.O. Technical Group)
Review by Accountable Engineer
Station Decision
Is NSM Acceptable ?
No
Return to Nucl.Maint./ Projects
Yes
Station Manager Approves
D


D
NSM transmitted to Nucl.Maint./ Projects
Nucl.Maint./Projects Prepares Regular WO and obtains approval
Nucl.Maint./Projects Prepares Letter on Need for Project Agreement
Project Control Resolves Conflicts
Project Agreement Written (If Required)
Nucl.Maint./Projects Adjusts Project Schedule
NSM, Accounting Information, and Schedule transmitted to PMD, Misc. Proj. Coord. (xc to G.O. Technical Group Station) (On B List)
NSM Sent to PMD, Proj. Engr.
NSM formally transmitted to Lead Division
E


E
C
Lead Division - Responsible Engineer (Lead Engineer)
1. Reviews NSM & prepares scope document.
2. Sends scope document to PMD for schedule P/L.
3. Transmits scope document & NSM copies to support divisions.
4. Establishes date and personnel for inter-disciplinary review within D.E.D., if required (*)
DE
* Lead Divisions & Support Divisions
* Design activities to support Nuclear Production
* PMD sets agenda and writes minutes for inter-disciplinary review meeting (NPD copied)
* Decision on design package content made by Lead Engr., Project Engr. & Station Accountable Engineer
Design is complete and safety evaluation checklist is prepared. Limited Edition Dwgs.and Design Summary Issued. All materials are requisitioned.
PMD, Project Engineer Issues Document Summary & notifies NPD all Design is released. (Off B List) (On C List)
Nucl. Maint./Projects Adjusts Schedule using input from SSD. Also, scope reviewed by NM/P for need to supplement work order.
NSM at Station with Design & Material Ordered
F


F
Implementation Procedures Written, As Required
Non-Safety Related
Safety Related (QA condition 1)
QA Review
SRC Review (MNS & CNS only)
Accountable Engineer Assures Ready for Implementation
Accountable Engineer writes Work Request or has SSD write Shutdown Request or Work Request
Implementation Planning (refer to Section 7.8 for details)
Implementation and Verification
Station Issues Revised Procedures, distributes interim drawings, and operational group accepts turnover
System Returned to Service
G


G
Station Projects Issues Notification of Completion to station groups, Nuclear Maint/Projects, PMD and others
Station Projects provides PMD with appropriate red-marked drawings and other technical information needed to update drawings (Off C List) (On D List)
Nucl.Maint./Projects closes work orders (if required)
PMD transmits update package to lead divisions and copies all support divisions. Punchlist schedule for drawing update is an automatic 60 days.
DE Release dwgs. to show "As-Built" Condition
PMD prepares & transmits Document Summary and notifies Station Projects that all "As-Built" drawings are released (Off D List)
NSM File Closed

Attachment 2

NUCLEAR STATION MODIFICATION IMPLEMENTATION PLAN

The following is an outline of the activities required to implement NSM MG-_____ at McGuire Nuclear Station. The activities shall include all major field work and testing requirements. The details of this work will be covered by the NSM/SSD work requests. The responsible work group is listed for each activity and comments are included as needed. NOTE: The comments section may include work request numbers, step by step instructions and specific requirements as needed. If additional space is necessary, sheets may be attached.

I. Prerequisite System Conditions

The following is a description of the steps that shall be taken in order to provide the proper system conditions for implementation of the NSM. (Note: These conditions include observations made by the accountable engineers in Projects during their review of the design package and are not intended to preclude any reviews done by Operations, Health Physics, Planning, SSD Technical Support, etc., which normally occur before field work may begin.) Examples of these conditions are: outage required or specific mode required, train A or B or both out of service, operability of other system(s) affected, Tech Spec requirements involved, and draining of piping systems, etc. It would be beneficial to mark up drawings if possible, showing the affected portion(s) of system(s).

II. Limits and Precautions

The following are limits and precautions that shall be considered before and during the implementation of the NSM. This shall include personnel and equipment safety requirements, with recommendations of preventive measures that can be taken. The possibility that other adjacent or connecting systems may be affected shall be considered.

ACTIVITY	RESPONSIBLE GROUP	PROCEDURES	COMMENTS

III. Directions for Implementation

A. Electrical

1. Install/modify electrical equipment (panelboards, transformers, switchgear, motor control centers, disconnects, breakers, switches, batteries, battery chargers, motors, generators, relays, cabinets, terminal boxes, fuse blocks)

DATE COMPLETE: _____

INITIAL: _____

---

2. Pull or delete cables, lugging, terminations, handling of spare conductors, penetration work, and cable separation.

DATE COMPLETED: _____

INITIAL: _____

---

3. Install/modify cable trays, conduit, electray, unistrut, required supports, and seismic mounting

DATE COMPLETED: _____

INITIAL: _____

	ACTIVITY	RESPONSIBLE GROUP	PROCEDURES	COMMENTS
4.	Install/modify lighting and lighting panelboards, switches, and any lighting panelboard load additions			

DATE COMPLETED: _____

INITIAL: _____

5. Control board changes (mounting of controls, cut-outs, welding, control board wiring, nomenclature, and train separation)

DATE COMPLETED: _____

INITIAL: _____

6. Install/modify valve operators, including set-up of actuators and limit switches, and solenoid valves

DATE COMPLETED: _____

INITIAL: _____

7. Miscellaneous wiring changes (Describe changes below)

DATE COMPLETED: _____

INITIAL: _____

	ACTIVITY	RESPONSIBLE GROUP	PROCEDURES	COMMENTS
8.	Check out of electrical circuits or controls (voltage/current/resistance checks, functional test, scaling, equipment rotational check, calibration).			

DATE COMPLETED: _____

INITIAL: _____

B. Instrumentation

1. Install/modify instrumentation (manifolds, root valves, panels, filter regulators, transmitters, sensors, parameter switches, gauges, orifices, cabinets, including mounting)

DATE COMPLETED: _____

INITIAL: _____

---

2. Install/modify instrument tubing (bending, cutting, and welding of capillary, impulse and process lines, including all types of fittings, supports, and seismic mounting).

DATE COMPLETED: _____

INITIAL: _____

	ACTIVITY	RESPONSIBLE GROUP	PROCEDURES	COMMENTS
3.	Check-out instrument loops including calibration of instruments, controls, and setpoint changes.			

DATE COMPLETED: _____

INITIAL: _____

C. Mechanical

1. Install/modify piping, elbows, tees, fittings, and flanges. Includes welding, cutting, and fitting.

DATE COMPLETED: _____

INITIAL: _____

---

2. Install/modify valves (describe changes below)

DATE COMPLETED: _____

INITIAL: _____

---

3. Install/modify mechanical equipment (pumps, heat exchangers, turbines, including alignment of equipment)

DATE COMPLETED: _____

INITIAL: _____

	ACTIVITY	RESPONSIBLE GROUP	PROCEDURES	COMMENTS
4.	Install/modify pipe supports (springs, snubbers, seismic, and rigid supports)			

DATE COMPLETED: _____

INITIAL: _____

---

5. Leak seals of valves, flanges (Furmanite, Leak Repair, etc.)

DATE COMPLETED: _____

INITIAL: _____

---

6. Heat exchanger, condenser tube, and steam generator tube modification/replacement

DATE COMPLETED: _____

INITIAL: _____

---

7. Install/modify HVAC equipment (ventilation units, coolers, heat exchangers, ductwork, ductwork supports, dampers, actuators, controls, cabinets, panels filters, includes functional testing, and balancing of systems).

DATE COMPLETED: _____

INITIAL: _____

	ACTIVITY	RESPONSIBLE GROUP	PROCEDURES	COMMENTS
8.	Plumbing			

DATE COMPLETED: _____

INITIAL: _____

---

9. Insulation work (piping, HVAC, Equipment, Mirror, and Nukon)

DATE COMPLETED: _____

INITIAL: _____

D. Civil/Miscellaneous

1. Masonry work (concrete pouring, rebar installation, rebar cutting, brickwork, blockwork, and grouting).

DATE COMPLETED: _____

INITIAL: _____

---

2. Core drill, installation of penetrations and pipe sleeves, and concrete cutting

DATE COMPLETED: _____

INITIAL: _____

	ACTIVITY	RESPONSIBLE GROUP	PROCEDURES	COMMENTS
3.	Installation of concrete anchors, all types of baseplates, concrete embeds, and seismic mounting			

DATE COMPLETED: _____

INITIAL: _____

4. Structural Steel Work (steel installation/modification, rigging, platforms, ladders, frames, railing, decking, grating, toeplates, stairs, cranes, jib booms

DATE COMPLETED: _____

INITIAL: _____

5. Scaffolding

DATE COMPLETED: _____

INITIAL: _____

6. Sandblasting and coating

DATE COMPLETED: _____

INITIAL: _____

ACTIVITY	RESPONSIBLE GROUP	PROCEDURES	COMMENTS

7. Fire protection systems (sprinklers, barriers, halon, hose cabinets, etc.)

DATE COMPLETED: _____

INITIAL: _____

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8. Excavation work, trenching, foundations, ditches, earthmoving

DATE COMPLETED: _____

INITIAL: _____

---

9. Surveying

DATE COMPLETED: _____

INITIAL: _____

---

10. All types of carpentry and building erection

DATE COMPLETED: _____

INITIAL: _____

---

11. Installation of fencing and barriers

DATE COMPLETED: _____

INITIAL: _____

ACTIVITY	RESPONSIBLE GROUP	PROCEDURES	COMMENTS
12. Roofing installation			

DATE COMPLETED: _____

INITIAL: _____

13. Other (See Attached Sheets)

IV. Work Sequence and Scheduling

The following will outline a required work sequence if there is any particular order in which the work must be done. Also, the scheduled start and finish dates with any designated dates for progress reviews are identified.

SCHEDULED START: _____

SCHEDULED COMPLETE: _____

PROGRESS REVIEWS: _____ INITIAL _____

_____ INITIAL _____

_____ INITIAL _____

_____ INITIAL _____

V. Post Modification Testing (PMT)

The following station procedures and test procedures will be required for functional checks and retest after completion of implementation and before the control of affected systems and components is returned to the Operational Control Group. The work request numbers for any Nuclear Production verification are listed also.

PROCEDURES WORK REQUESTS

DATE COMPLETED: _____

INITIAL: _____