

NRC INSPECTION L L N L L L

Inspection Procedure 71841

HUMAN PERFORMANCE

PROGRAM APPLICABILITY: 2515, Appendix B

71841-01 INSPECTION OBJECTIVE

01.01 To assess the adequacy of the licensee's root cause evaluation and corrective actions with respect to human performance.

01.02 To independently assess the extent of condition associated with the identified human performance root causes.

71841-02 INSPECTION REQUIREMENTS

This inspection will substantiate that the licensee has adequately identified in their evaluation, the root cause(s) or contributing causes(s) and taken appropriate corrective actions for each human performance related issue.

This inspection will also independently assess extent of condition(s) with respect to human performance such that each human performance identified problem has been evaluated for potential impacts on other plant equipment, programs or processes.

In completing this inspection procedure it is not expected that NRC inspectors perform a full evaluation of each causal factor listed below. However, the inspectors should assure themselves that they have independently reviewed the underlined topic areas to determine their applicability to the human performance issue(s) of concern. The inspector should check each topic area for possible applicability and if the area is applicable should then review each causal factor within that section of the table. Questions to address each causal factor are provided in the specific guidance area of this procedure.

Topic Areas and Causal Factors:

(See tables starting on page 6 for more detail)

02.01 Human-System Interface

a. Visual Information/display

- missing
- incorrect
- mistrusted
- visibility less than adequate (LTA)
- content LTA
- organization/format LTA
- too much information
- insufficient information
- identifiers (labels and tagouts, warnings and postings) LTA
- confusing
- accessibility LTA
- navigation LTA (method of movement through displays)
- conflicting
- unstable

b. Control function/control device

- missing
- accessibility/location for hard-wired controls LTA
- accessibility of soft (software mediated) controls LTA
- movement/motion LTA
- function LTA
- too many concurrent actions
- response/feedback LTA
- identification (labels and tagouts) LTA

c. Alarm/annunciation

- missing
- too many/not prioritized
- auditory warning LTA
- organization/format LTA
- content LTA
- visibility/conspicuity LTA
- continuously illuminated
- continuously repeated
- disabled
- alarm procedure availability/accessibility LTA
- computer printout and control room log differ
- navigation LTA
- alarm response LTA

02.02 Environment

- too hot
- too cold
- too humid
- too dark
- too bright
- too noisy
- cramped/inaccessible workplace
- dangerous work place
- distractions prevalent
- high radiation/toxicity
- vibration impedes work

02.03 Communication

- missing/lack of information
- content LTA
- untimely information
- misunderstood/misinterpreted
- inconsistent information
- repeat-back LTA
- verification LTA
- mode/communication devices LTA
- logbook maintenance LTA
- work package LTA
- document management LTA
- standard terminology LTA
- information about system/equipment LTA
- information not sought
- information not used

02.04 Coordination of Work/Supervision

- supervisory availability LTA
- task description/explanation LTA
- coordination of team activities LTA
- assignments of roles and responsibilities LTA
- task progress monitoring LTA
- chain of command LTA
- oversight LTA
- staff working hours program LTA
- pre-job briefing LTA
- shift turnover LTA
- planning and scheduling work LTA
- resource allocation LTA

02.05 Work Practices

- formalization of work practices LTA
- self-checking LTA
- independent verification LTA
- walkdowns LTA
- inattention to detail
- lack of questioning attitude
- lack of awareness of equipment status
- lack of awareness of plant condition (situation awareness LTA)
- lack safe work practices
- improper tools/materials used
- teamwork LTA
- housekeeping LTA
- too many task interruptions
- too many concurrent tasks
- excessive workload
- time pressure to complete tasks
- cognitive overload
- cognitive underload (boredom)

02.06 Procedure use/adherence (for procedure quality use IP 42001 or IP 42700)

- no procedure/unavailable
- procedure/references not used
- procedure prerequisites not met
- procedure steps circumvented
- procedure modification process LTA
- incorrect procedure used
- procedure believed to be incorrect

02.07 Training and qualifications (use IP41500 and NUREG-1220)

02.08 Fitness For Duty

- substance abuse (chemical and alcohol)
- illness
- fatigue
- excessive overtime
- working too long without resting/working continuously without breaks
- too many distractions
- night work
- called into work outside regular schedule

71841-03 INSPECTION GUIDANCE

General Guidance

This inspection procedure is designed to be used to assess the adequacy of the licensee's evaluation of human performance issues. As such, a reasonable time (generally within 30-60 days) should be allowed for the licensee to complete their evaluation; however, all corrective actions may not be fully completed upon commencement of this procedure.

At least one inspector assigned to this inspection should have had recent or refresher training (within 5 years) in a recognized root cause technique (e.g. HPIP, MORT). In addition, the inspector should be familiar with the discipline or system associated with issue.

The tables contained in the Specific Guidance section are provided as guidance to help the inspector fulfill the inspection requirements contained in paragraph 02. It is not intended that the inspector perform a full evaluation of each causal factor, however to the extent that the human performance issue contains features related to the causal factor that entire section should be consulted. The intent is that the inspector use the guidance contained in the tables to verify that the licensee's evaluation identified the appropriate deficiencies associated with the performance issue and that the licensee has initiated a reasonable corrective action. Should the inspector not be able to make an assessment from the answers to the questions, he/she should consult with the human factors specialists in headquarters.

Inspectors should be aware that more than one corrective action may be necessary to correct a particular contributing or root cause. In addition, the inspectors may need to look at several identified contributing or root causes for the human performance issue. Although unlikely, one human performance root cause may cover an entire white, yellow or red input or more likely may be one of several root causes identified within a white, yellow or red input.

Definitions

Root Cause(s) is defined as the basic reason(s) (i.e., hardware, process, human performance), for a problem, which if corrected, will prevent recurrence of that problem.

Contributing Cause(s) is defined as causes that by themselves would not create the problem, but are important enough to be recognized as needing corrective action. Contributing causes are those actions, conditions, or events which directly or indirectly influence the outcome of a situation or problem.

Extent of Condition is defined as the extent to which an identified problem has the potential to impact other plant equipment, programs or processes in the same manner identified in the root cause analysis.

Human-system Interface (HSI) is defined as the technology through which personnel interact with systems, e.g. alarms, displays, controls, procedures, valve handles, test points.

Specific Guidance

The information contained in this section provides the inspector with specific guidance on how to determine if the licensee's root cause evaluation and corrective actions were adequately performed and implemented. The inspector will, using the information provided to him by the licensee (e.g., licensee's root cause analysis and corrective action plan/results), selectively apply the guidance in the attribute table(s) that relates to the problem evaluated by the licensee to determine whether the licensee's evaluation and corrective action processes have adequately considered the attributes contained in the relevant tables. For example, if it is determined that a human-system interface

deficiency(ies) such as incorrect information being displayed by an instrument was identified as a cause by the licensee in its evaluation, the inspector would use the Visual Information table to evaluate the thoroughness of the licensee's evaluation of this cause. It is intended that the inspector will incorporate an explanation in the inspection report to document the licensee's responses to items in columns (1) through (3) for each of the applicable attributes that the inspector evaluates.

With respect to "extent of condition", the inspector is expected to determine if the licensee adequately determined if the identified root cause(s) could have impacted other plant equipment, programs or processes. If the licensee did not adequately investigate extent of condition of the human performance problem then it is expected that the inspector will independently follow-up. The inspector should use column 3 as a guide to ask the appropriate questions to ascertain if other potential areas or conditions also need corrective actions.

Human-System Interface

Visual Information/Display

(1) Causal Factors: (Root Cause or contributing cause)	(2) For each of the items provide the evidence used to identify the root cause	(3) For the immediate condition as well as for any other related applicable conditions has the licensee:	(4) References
missing	What is the specific missing information?	provided the missing information satisfactorily?	
incorrect	What is incorrect about the information?	corrected the information satisfactorily?	NUREG-0700, Rev. 1, Paragraph (0700) - 1.4
mistrusted	Why is the information mistrusted?	eliminated the reason for mistrust satisfactorily?	0700 - 1.4
visibility LTA (LTA = less than adequate)	Why is the information difficult to see? Is it in a poor location? Too small? Poor contrast to background (color, brightness, glare)?	relocated the information? Enlarged the font? Improved the contrast improved?	0700 - 1.1, 1.2, 1.3, 1.5
content LTA	What specifically is inadequate about the information content?	improved the content satisfactorily?	0700 - 1.1, 1.4
organization/ format LTA	Is the organization/format confusing? What specifically is confusing?	improved the organization/format satisfactorily to eliminate the confusion?	0700 - 1.1, 1.2, 1.3
too much information	Is there unneeded information such that the needed information is difficult to find?	removed the unneeded information or provided a method of prioritizing the needed information?	0700 - 1.1

insufficient information	Is there not enough information to meet the need?	added information to meet the need?	0700 - 1.1-10
identifiers (labels and tagouts, warnings and postings) LTA	Is the equipment not labeled or labeled poorly such that it is not easily identified? Are the identifiers missing, inaccurate, confusing or difficult to detect? Do tagouts obscure other information?	labeled or improved the information labeling satisfactorily? Provided evidence that warnings and postings are inadequate? Improved the identifier program to eliminate problems?	0700 - 1.1, 1.2, 1.3
confusing	Is the information as presented confusing? What is the source of the confusion?	taken steps to eliminate the confusion?	0700 - 1.1, 1.2, 1.3
accessibility LTA	Why is the information difficult to access?	improved the accessibility of the information?	0700 - 1.1, 2.5
navigation LTA (method of moving through displays)	Is it difficult or cumbersome accessing the desired display?	taken steps to improve display access?	0700 - 2.
conflicting	Are there conflicts between multiple sources of the same information?	corrected the source of the information conflict?	0700 - 1.4
unstable	Is there a mismatch between the parameter being measured and the displayed information for that parameter?	identified the source of the mismatch (e.g., display, signal, sensor)? Corrected the source of the information mismatch?	0700 - 1.4

Control Function/Control Device

(1) Causal Factors: (Root Cause or contributing cause)	(2) For each of the items provide the evidence used to identify the root cause	(3) For the immediate condition as well as for any other related applicable conditions has the licensee:	(4) References
missing	What specific control function is missing?	provided the necessary control function where needed?	
accessibility/ location for hard-wired controls LTA	Is the control too high? Too low? Too far from associated displays? Is it blocked/covered by other equipment?	moved the control to a satisfactory location or removed impeding equipment?	0700 - 3.1, 3.3, 3.4
accessibility of soft controls LTA	Is the control accessible? Why is the control inaccessible?	improved the accessibility of the control?	0700 - 2.1, 3.1, 3.2, 3.4

movement/ motion LTA	Is the direction of motion correct/intuitive? Is it difficult to operate (tension too great, range of movement too great, too small?). Is the control size/shape uncomfortable?	corrected the control movement/motion/feel?	0700 - 3.1, 3.2, 3.3
function LTA	Is the function of the control appropriate? Does it do what is required of the task/action?	corrected the control to provide the required function?	0700 - 2.1, 2.2, 2.3, 2.5, 2.6, 2.7
too many concurrent actions	Does the operator have to perform too many control actions concurrently or within too short of a time period?	corrected the concurrent action problem satisfactorily?	0700 - 2.1
response/ feedback LTA	Is the response/feedback satisfactory? Can the operator understand what the control action has accomplished? Is response/feedback timely?	provided a satisfactory and timely response/feedback?	0700 - 2.4, 3.4
identification (labels and tagouts) LTA	Is the control function not labeled or labeled poorly such that it is not easily identified?	labeled or improved the control function labeling satisfactorily?	0700 - 2.1, 3.1, 3.2, 3.3, 3.4

Alarm/annunciation

(1) Causal Factors: (Root Cause or contributing cause)	(2) For each of the items provide the evidence used to identify the root cause	(3) For the immediate condition as well as for any other related applicable conditions has the licensee:	(4) References
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missing	What specific alarm is missing? What function needs to be alarmed that currently is not?	provided the needed alarm satisfactorily?	0700 - 4.2
too many/not prioritized	Do too many alarms activate simultaneously such that the operator does not know how to respond? Are the alarms not prioritized?	reduced the number of alarms such that the operator can respond properly? Has the licensee implemented an effective alarm prioritization system?	0700 - 4.2, 4.3, 4.4, 4.5
auditory warning LTA	Auditory warning too loud? Too soft? Wrong pitch? Not sufficiently discriminable from other alarms or background?	corrected the auditory deficiencies?	0700 - 4.5.6.3
organization/format LTA	Are the alarms located and grouped in a way that makes it difficult to quickly locate alarms that are related to each other and to the systems that trigger them?	corrected deficiencies in location and organization of alarms?	0700 - 4.1, 4.5
content LTA	Is the information presented by the alarm insufficient to quickly and clearly understand the condition which it is intended to convey?	corrected the alarm presentation to convey the intended information?	0700 - 4.1, 4.2, 4.5
visibility/conspicuity LTA	Why is the alarm difficult to see or discern? Is it in a poor location? Is it obscured by other equipment? Is it too small? Does it visually stand out from its background? Is the information presented on the alarm difficult to read do to size, color, contrast, font, number of characters, etc.?	relocated or redesigned the alarm or removed obscuring equipment?	0700 - 4.5, 4.10
continuously illuminated	Is an alarm condition continuously illuminated, if the continuous illumination is not necessary for operator information or action?	corrected all inappropriately illuminated alarms?	0700 - 4.2
continuously repeated	Does an alarm inappropriately continue to activate even after it has been acknowledged?	corrected alarms that inappropriately repeat after acknowledgment?	0700 - 4.2
disabled	Has an alarm been inappropriately been disabled? Has the licensee determined why?	corrected this problem?	
alarm procedure availability/accessibility LTA	Are the alarm procedures readily available and accessible?	adequately improved procedure availability and/or accessibility?	0700 - 4.5, 4.9

computer printout and control room log differ	Are the alarm list and control room log consistent?	determined the source of the difference and resolved the problem?	
navigation LTA	Are computer-based alarms accessible without excessive need to search thru numerous computer screens?	adequately improved the navigation for alarm systems?	0700 - 4.6.1
alarm response LTA	What was inadequate about the alarm response controls, methodology or procedure?	adequately improved the response?	0700 - 4.5.3, 4.6, 4.9

Environment

(1) Causal Factors: (Root Cause or contributing cause)	(2) For each of the items provide the evidence used to identify the root cause	(3) For the immediate condition as well as for any other related applicable conditions has the licensee:	(4) References
too hot	What is the evidence that the working environment was too hot for sustained safe task performance? What is the evidence that support tools and equipment (coolers), protective gear (Cold Suit), or appropriate work practices and procedures (exposure limits) were unavailable or not used.	taken steps to reduce the temperature?	0700 - 7.3.1, 7.3.2, 8.5.1 NUREG/CR-5680, Para. (5680) - 4.2, 4.3, 4.5
too cold	What is the evidence that the working environment was too cold for sustained safe task performance? What is the evidence that support tools and equipment (heaters), protective gear (insulated clothing), or appropriate work practices and procedures (exposure limits) were unavailable or not used.	taken steps to increase the temperature?	0700 - 7.3.1, 7.3.2, 8.5.1 5680 - 5.2, 5.3, 5.5
too humid	What is the evidence that the working environment was too humid for sustained safe task performance? What is the evidence that support tools and equipment (fan), or appropriate work practices and procedures (exposure limits) were unavailable or not used.	taken steps to reduce the humidity?	0700 - 7.3.1, 7.3.2, 8.5.1 5680 - 4.2, 4.3, 4.5

too dark	What is the evidence that the working environment was too dark for safe task performance? What is the evidence that support tools and equipment (temporary lighting) or appropriate work practices and procedures were unavailable or not used.	taken steps to improve the lighting?	0700 - 7.3.3, 7.3.4, 8.5.3 5680 - 6.2, 6.3, 6.5
too bright	What is the evidence that lighting in the working environment impeded safe task performance or personnel safety? What is the evidence that brightness, aim, location, glare or beam angle adversely effected visual performance?	taken step to reduce the brightness, glare, etc.?	0700 - 7.3.3, 7.3.4, 8.5.3 5680 - 6.2, 6.3, 6.5
too noisy	What is the evidence that the working environment was too noisy for sustained safe task performance or masks necessary auditory signals and communications? What is the evidence that protective gear (hearing protectors) or appropriate work practices and procedures (exposure limits) were unavailable or not used?	taken steps to reduce the noise?	0700 - 7.3.5, 8.5.2 5680 - 3.2, 3.3, 3.5
cramped/ inaccessible workplace	What is the evidence that cramped/inaccessible workplaces detracts from sustained safe task performance? What is the evidence that support equipment (creeper, ladder), training, labels, or appropriate work practices and procedures were unavailable or not used?	taken steps to enlarge the working area and/or improve access?	0700 - 7.4, 8.2, 8.5.2
dangerous work place	What is the evidence that the work environment contributes to slips, falls or other physical injuries? What is the evidence that poor housekeeping contributed to the situation? What is the evidence that warnings and cautions are not present?	taken steps to correct the dangerous working conditions?	
distractions prevalent	What is the evidence that distractions impede safe task performance? What are the distractions?	taken steps to eliminate the distractions?	

high radiation/ toxicity	What is the evidence that excessive radiation or toxicity in the working environment adversely effected sustained safe task performance or personnel safety? What is the evidence that support equipment (alarming dosimeter), protective gear (rad protection suit), or appropriate work practices and procedures (exposure limits) were unavailable or not used.	taken steps to correct the situation?	
vibration impedes work	What is the evidence that there was excessive vibration in the working environment which impeded sustained safe task performance? What is the evidence that equipment was insufficiently balanced, damped or isolated, protective gear, or appropriate work practices and procedures (exposure limits) were unavailable or not used.	taken steps to reduce the vibrations?	5680 - 2.2, 2.3, 2.5

Communication

The factors below apply to (1) both written and/or verbal communications, (2) both intra- and inter-departmental communications and (3) all situations e.g. control room, work stations, pre-job briefings, shift turnover, etc.

(1) Causal Factors: (Root Cause or contributing cause)	(2) For each of the items provide the evidence used to identify the root cause	(3) For the immediate condition as well as for any other related applicable conditions has the licensee taken steps to ensure that:	(4) References
missing/lack of information	Did the sender send and the receiver receive the necessary information?	the necessary information is sent and received?	NUREG-1545, Para. (1545) - 2.3, 2.4, 2.5, 2.6
content LTA	Was the information correct? Was the message appropriate for the work environment, the job at hand, and the receivers level of knowledge? Was the terminology familiar to the receiver?	the proper, accurate and concise information is provided?	1545 - 2.3.1, 2.4.1, 2.5, 2.6
untimely information	Was the message sent at the correct time to be useful?	information is transmitted in a timely manner?	1545 - 2.4.1
misunderstood/misinterpreted	Did the receiver interpret the message consistent with the sender's meaning?	message content is clear and understandable?	
inconsistent information	Was the information consistent with other information about performing the task?	transmitted messages contain consistent information?	
repeat-back LTA	Did the receiver confirm receipt and understanding of information by repeating what was heard in appropriate situations.	the proper repeat-back procedure is understood and implemented?	1545 - 2.4.1
verification LTA	Did the sender ensure that the information was received and understood? Did the receiver confirm the correct interpretation of the message?	message verification procedures are in place and properly implemented?	1545 - 2.4.1
mode/communication devices LTA	Was the message produced so that it was easy to hear or read?	all communication devices are available and in proper working order?	0700 - 6.1, 6.2, 6.3 1545 - 2.4.1
logbook maintenance LTA	Are entries accurate and timely? Do they reflect plant activities and status?	logbooks are properly maintained according to plant procedure?	

work package LTA	Is the information complete? Is it accurate?	work packages are properly filled out, and contain complete and accurate information?	
document management LTA	Were there omissions and/or technical inaccuracies in developing and managing technical documentation resulting in communication errors?	the document management system is effective and is implemented properly?	
standard terminology LTA	Was standard terminology used?	standard terminology is in place and is used in all appropriate communications?	
information about system/equipment LTA	Were deficiencies or status changes reported/recorded?	system/equipment status is properly understood, reported and recorded?	
information not sought	Did the receiver seek out the information needed to perform the job?	necessary information is requested as appropriate?	
information not used	Did the receiver use the necessary information?	necessary information is used when received?	

Coordination of Work/Supervision

(1) Causal Factors: (Root Cause or contributing cause)	(2) For each of the items provide the evidence used to identify the root cause	(3) For the immediate condition as well as for any other related applicable conditions has the licensee taken steps to ensure that:	(4) References
supervisory availability LTA	Were supervisors available to the workers as necessary?	the proper supervisors are available when required?	NUREG/CR-5455, Vol. 2, Sec. (HPIP) - 16
task description/explanation LTA	Did the supervisors ensure that the workers understood the assigned tasks? Did the supervisors coordinate between departments as necessary?	workers fully understand what they are to do and how to accomplish it?	
coordination of team activities LTA	what was the evidence that there was insufficient coordination of team activities	team coordination is understood and being implemented?	HPIP - 16
assignments of roles and responsibilities LTA	Did the supervisors match tasks to the appropriate personnel?	assignments are appropriate to the skills and availability of personnel?	HPIP - 16

task progress monitoring LTA	Were the work activities tracked?	work activities and progress are appropriately monitored?	
chain of command LTA	Were reporting responsibilities clear?	reporting responsibilities are clear and are being implemented properly?	
oversight LTA	Did the supervisor provide appropriate oversight of all work activities within their organizational unit?	oversight is being appropriately implemented?	HPIP - 16
staff working hours program LTA	Was circadian cycle considered during scheduling work? Was overtime considered during work scheduling? **** See fitness for duty for additional questions.	the Commission's policy statement was taken into consideration in the overtime planning and implementation?	Generic Letter 82-12, Commission Policy Statement 10 CFR 26.20
pre-job briefing LTA	Did the supervisor ensure adequacy of pre-job briefings? Was a pre-job briefing held if necessary?	pre-job briefings contain complete and accurate information, including all necessary cautions and warnings, and are conducted properly?	HPIP - 16
shift turnover LTA	Did the supervisor ensure adequacy of shift turnover?	shift turnover process has been improved to provide complete and accurate status information?	
planning and scheduling work LTA	Was work planned adequately e.g. site visits, job walkthru, special requirements and constraints identified? Were personnel workload and workflow well managed? Was work prioritized? Were possible conflicts identified?	the work planning and scheduling process has been improved to mitigate the problems identified?	HPIP - 16
resource allocation LTA	Were sufficient workers assigned, appropriate materials available and sufficient time allocated for the job?	sufficient resources have been made available to accomplish the planned activities?	

Work Practices

(1) Causal Factors: (Root Cause or contributing cause)	(2) For each of the items provide the evidence used to identify the root cause	(3) For the immediate condition as well as for any other related applicable conditions has the licensee:	(4) References
formalization of work practices LTA	Are work practices formalized? How were work practices formalized?	developed a formal work practice?	

self-checking LTA	Was there evidence of self-checking? Was there adequate self-checking?	emphasized self checking in training?	
independent verification LTA	Was there evidence of independent verification? Was there adequate independent verification?	supplied adequate staffing for independent verification?	
walkdowns LTA	Did a walkdown occur during turnover? Was the walkdown conducted adequately?	improved the walkdown process?	HPIP - 16
inattention to detail	What evidence does the licensee have that the root cause was inattention to detail? Why was inattention to detail selected as the root cause?	fixed the problem to prevent recurrence?	
lack of questioning attitude	What evidence was there of a questioning attitude? Was there evidence of a general lack of questioning attitude?	put into effect programs that are likely to improve questioning attitude among staff? addressed any generic findings?	
Lack of awareness of equipment status	What evidence was there of a lack of awareness of equipment status?	taken the appropriate steps to assure that staff is aware of equipment status?	
Lack of awareness of plant condition (situation awareness LTA)	What evidence was there of a lack of awareness of the plant condition?	address any generic findings?	
lack safe work practices	What is the evidence that supports that staff is not using safe work practices? Does the evidence support the finding?	address the finding with an appropriate corrective action? Does the corrective action address any generic findings?	
improper tools/materials used	Why was improper equipment used? Availability? Did the work control system indicate the appropriate tools needed?	addressed this issue?	
teamwork LTA	What is the evidence of lack of proper teamwork?	taken steps to improve teamwork ? Are these steps adequate?	HPIP - 16
housekeeping LTA	What is the evidence of poor housekeeping?	taken steps to improve housekeeping? Are these steps adequate?	
too many task interruptions	What is the evidence that task interruptions had an impact on job performance?	taken steps to eliminate or reduce the interruptions?	

too many concurrent tasks	What is the evidence that working too many concurrent tasks was responsible for/or contributed to human performance error? Did the licensee complete a check of work request records as soon as possible after the event? Did the licensee interview personnel involved with the event concerning their perception of their workload as soon as possible after the event?	redistributed work responsibilities?	
excessive workload	What is the evidence that excessive workload was responsible for/or contributed to human performance error? Did the licensee complete a check of work request records as soon as possible after the event? Did the licensee interview personnel involved with the event concerning their workload as soon as possible after the event?	taken action to reduce excessive workload?	
time pressure to complete tasks	What is the evidence that working under excessive time pressure to complete tasks was responsible for/or contributed to human performance error? Did the licensee interview personnel involved with the event concerning their perception of time pressure to complete tasks as soon as possible after the event?	reduced the effects of time pressures?	
cognitive overload	What is the evidence that task complexity was responsible for/or contributed to human performance error? Did the licensee interview personnel involved with the event concerning their perception of the complexity of the tasks they were performing as being a contributor to the event?	taken steps to relieve the cognitive overload?	
cognitive underload (boredom)	What is the evidence that boredom was responsible for/or contributed to human performance error? Did the licensee interview personnel involved with the event concerning their perception of the complexity of the tasks they were performing as being a contributor to the event?	taken steps to relieve boredom?	

Procedure use/adherence (for procedure quality use IP42001 or IP42700)

(1) Causal Factors: (Root Cause or contributing cause)	(2) For each of the items provide the evidence used to identify the root cause	(3) For the immediate condition as well as for any other related applicable conditions has the licensee taken steps to:	(4) References
no procedure/ unavailable	Why did the procedure not exist or was unavailable?	ensure a procedure was made available?	
procedure/ references not used	What is the evidence that a procedure/reference was not used?	ensure that procedures/references will be used in the future?	SECY-90-337
procedure prerequisites not met	Why were prerequisites not met?	ensure all procedure prerequisites will be met in the future?	SECY-90-337
procedure steps circumvented	Why were procedure steps circumvented?	ensure that steps will not be circumvented in the future?	SECY-90-337
procedure modification process LTA	What is the evidence that the procedure modification process is LTA? What is wrong with the process?	correct the deficiency?	SECY-90-337
incorrect procedure used	What is the evidence that an incorrect procedure was used? Why was an incorrect procedure used?	ensure that incorrect procedures will not be used in the future?	
procedure believed to be incorrect	What is the evidence to believe that the procedure was incorrect? Was it incorrect?	restore confidence in the correctness of procedures?	

TRAINING AND QUALIFICATIONS (USE IP41500 AND NUREG-1220)

FITNESS FOR DUTY:

(1) Causal Factors: (Root Cause or contributing cause)	(2) For each of the items provide the evidence used to identify the root cause	(3) For the immediate condition as well as for any other related applicable conditions has the licensee:	(4) References
substance abuse (chemical and alcohol)	What is the evidence that substance abuse was responsible for/or contributed to human performance error? Did the licensee complete for-cause testing as soon as possible in accordance with 10 CFR 26.24 (3) in cases of suspected substance abuse?	assured that substance abuse would not be tolerated at the plant? correctly and fully implemented all elements of their FFD program and procedures including training and FFD testing.	10 CFR 26.20, 26.24
illness	What is the evidence that Illness/injury was responsible for/or contributed to human performance error? Did the licensee complete a medical records check of personnel directly involved as soon as possible after the event?	adequately implemented its behavior observation program and assured that sick employees would not be assigned to safety significant jobs?	10 CFR 26.20
fatigue	What is the evidence that fatigue was responsible for/or contributed to human performance error?	adequately implemented its behavior observation program and assured that fatigued individuals are removed from duty?	10 CFR 26.20 Generic Letter 82-12
excessive overtime	What is the evidence that excessive overtime was responsible for/or contributed to human performance error? Did the licensee complete a check of the shift logs and timekeeping records as soon as possible after the event?	taken action to reduce excessive overtime?	10 CFR 26.20 Generic Letter 82-12

working too long without resting/working continuously without breaks	What is the evidence that personnel working excessive time without rest breaks was responsible for/or contributed to human performance error? Did the licensee complete a check of the shift logs and timekeeping records as soon as possible after the event? Did the licensee interview personnel involved with the event concerning their work periods as soon as possible after the event?	assured that fatigue would not result from working too long?	10 CFR 26.20
too many distractions	What is the evidence that being distracted was responsible for/or contributed to human performance error? Did the licensee interview personnel involved with the event concerning their perception of distractions as being a contributor to the event?	reduced distractions from critical work situations?	
night work	What is the evidence that working under nighttime work conditions was responsible for/or contributed to human performance error? Did the licensee complete a check of the shift logs and timekeeping records as soon as possible after the event? Did the licensee interview personnel involved with the event concerning their work periods as soon as possible after the event?	reduced the effects of night work?	
called into work outside regular schedule	What is the evidence that working irregular hours/hours outside regularly scheduled hours was responsible for/or contributed to human performance error? Did the licensee complete a check of the shift logs and timekeeping records as soon as possible after the event? Did the licensee interview personnel involved with the event concerning their work periods as soon as possible after the event?	reduced the effects of unscheduled work hours? adequately and correctly implement its FFD procedures for call-ins?	

71841-04 RESOURCE ESTIMATE

It is estimated that this procedure will take between 8 and 40 staff-hours to complete for each human performance issue. The inspector or inspectors assigned should be familiar with the discipline associated with the subject of the licensee's evaluation and should have had training in one of the appropriate root cause analysis methods. The resource determination should be at the

discretion of regional management depending on the number of topic areas that have been identified as related to the human performance issue. For planning purposes, a resource estimate near the lower end of the scale should be used for licensees with corrective actions programs that have been determined to be thorough during the annual inspection for the identification and resolution of problems. For licensees with corrective action programs that have been previously determined to be ineffective, a resource estimate near the higher end of the scale should be used.

71841-05 REFERENCES

10 CFR Part 26, Fitness for Duty Programs

SECY-90-337, Procedural Adherence Requirements

Generic Letter No. 82-12, Nuclear Power Plant Staff Working Hours

NUREG-0700, Rev. 1, Vol. 1 - Human-System Interface Design Review Guideline

NUREG-1220, Rev. 1, Training Review Criteria and Procedures

NUREG-1545, Evaluation Criteria for Communication-Related Corrective Action Plans

NUREG/CR-5680, The Impact of Environmental Conditions on Human Performance

NUREG/CR-5455, Vol. 2, Development of the NRC's Human Performance Investigation Process (HPIP), Investigator's Manual

END