

December 10, 1996

Mr. Roy Ramsdell
Vermont Yankee Nuclear Power Corporation
P.O. Box 157
Governor Hunt Road
Vernon, VT 05354-0157

Dear Mr. Ramsdell:

In response to your telephone inquiry concerning the Human Factors Information System (HFIS) I have enclosed excerpts from the HFIS User's Manual. These excerpts are the guidelines that the staff uses for coding Licensee Event Reports and inspection reports. As discussed in our telephone conversation, public access to data in HFIS will be made available through the World Wide Web during the next 6 to 12 months. The U.S. Nuclear Regulatory Commission's address on the World Wide Web is WWW.NRC.GOV.

If you have any questions concerning the information I have provided you can contact me at 301-415-1043.

Sincerely,

Original Sign

David R. Desaulniers
Human Factors Engineer
Human Factors Assessment Branch
Division of Reactor Controls
and Human Factors
Office of Nuclear Reactor Regulation

Enclosure: As stated

cc: CThomas w/o enclosure

Distribution:

PDR

HHFB RF

Document Name: G:\DAVE\HFIS2VY.01

To receive a copy of this document, indicate in the box "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	HHFB/DRCH	E
NAME	DDesaulniers:sc	SRD
DATE	12/10/96	

OFFICIAL RECORD COPY

9612160203 961210
PDR ADDCK 05000271
P PDR

1/1
DFOI

HUMAN FACTORS INFORMATION SYSTEM
LER CODING INSTRUCTIONS

General guidance:

First, determine if LER is human performance related (HPR). This can usually be done by reading the root cause section of the LER. An event is HPR if the root cause involves:

- personnel error
- procedure problems
- planning and scheduling problems
- training problems
- communication problems
- work environment problems

Code all human performance related LER's, even those identified as voluntary.

If cause is unknown and report indicates in block 14 that supplemental information will be submitted, discard LER and code when supplemental report is filed.

Plant name: select name from pick list on HFIS.

Docket number: enter 3-digit number

Event date: enter date as it appears in block 5 of LER.
Always use 2-digit entries for day and month.

LER Number enter year and sequential number of LER shown in block 6 of LER. Sequential number should always be 3 digits. Use zeros to any empty spaces.
Example: 93-003 or 93-022

Event time: enter information based on a 24-hour clock. Each time entry should contain 4 digits. The time should reflect the time the action/event occurred (ESF actuation, time of inappropriate action) or should have occurred (time of day of missed fire watch) and not the time the error was discovered.

02/18/94
REVISION 1

Enter "NA" for event time if the time is not stated, or if the time when the error is discovered is not related to the original error. For example, the discovery time for an incorrectly assembled valve or the discovery of an incorrect calculation are not related to the original error and should be coded "NA". The one exception to this is if the LER states the time of the original error. Using the above example, if the LER states the time that the valve was incorrectly assembled, then code the time. NA is not accepted as a valid event time. A "0" is used if the event time is unknown or not applicable. If the power level is NA and the event time is 0, this is equivalent to event time being NA. A known or unknown power level and a 0 event time is equivalent to an unknown event time.

Issue date: No data entry required.

Power level: Enter the actual power level when an event occurred during and is related to the power level.

Enter "0" only when the event occurred during and is related to the shutdown condition.

Enter NA when the reported event is unrelated to the power level. (Example: engineering re-analysis)

Micro fiche: No data entry required

Systems Involved: No data entry required

**Personnel
Category:**

General guidance:

- Choose all that apply.
- Each category contains both workers, supervisors, planners and procedure writers in that work group.
- Choose only those individuals involved with committing or exacerbating an error not those that discover the error.
- If the personnel category of the worker committing the error is unknown, leave the category blank.
- Text may not specifically name a personnel category. However, if the text contains sufficient information to identify the category, code as appropriate using work group definitions.
- If the LER does not specifically state that operations workers are licensed, select "non-licensed operator".
- If personnel are contract workers, code by work area and enter "contractor" under "other".

Work group definitions:

Licensed Operator: all licensed operators including RO and SRO, regardless of position. This category included SS and STA (if the text specifically states that the STA is licensed.)

Non-licensed operator: operations personnel when the LER does not specifically state that workers are licensed and includes rad-waste operators, auxiliary operators, and plant equipment operators.

Instrument and control: includes technicians referred to by this name; may also include those titled maintenance technicians.

Electrical: includes electricians and electrical maintenance personnel.

Mechanical: includes mechanics and mechanical maintenance personnel.

02/18/94
REVISION 1

Personnel
Category
Cont'd

Engineer: includes all types of engineers.

Radiological protection: includes health physics, RP or HP technicians.

Chemistry: includes chemistry and radiochemistry technicians.

Security: includes all security workers

Other: include the following personnel in this category by writing in the name of the group. QA/QC, Fire, and Contractor (together with the category the contractor is working).

Work Type:

General guidance:

- Check all that apply
- Focus on the type of work being done when the error was committed, not the work in progress when the error is discovered. If unable to determine the work type when error was committed, then leave blank.

Work type definitions:

Operating: all normal, abnormal and emergency operating activities including planning and scheduling, fire watch, walkdowns, operator rounds and general outage activities

Testing: testing of equipment including all post maintenance and surveillance testing.

activities.
Calibration: all calibration and adjustment

Troubleshooting: activities involving a set process used to identify source of a known problem.

Maintenance: general maintenance and repair

Engineering: all engineering activities including calculations

Procedure development: all work involved with the development and revision to procedures

Refueling: limited to refueling floor activities

Modification: any activities involving physical installation of a design change to the plant.

Other: includes housekeeping (events involving cleaning activities), radiological (decontamination activities), and QA/QC.

Type of
Task
Behavior:

Skill-based - highly automated sensory-motor and cognitive performance taking place without conscious control

Rule-based - rules or patterns of behavior that are to some extent able to be memorized

Knowledge-based - decision making and problem solving occur

Action Error: Focus on the error when it was committed not when it is discovered. This may require some level of interpretation. If available information is insufficient to make a determination, select "Unavailable"

Action error definitions:

Untimely action: correct action at the wrong time (ex. beginning work before authorized)

Omission: failure to perform all steps in a task (both procedure governed and non-procedure governed (ex. failure to notify control room of beginning of test)

Out of sequence: perform task steps in the wrong order

Wrong action: correctly performs an action which should not have been performed (ex. wrong unit/wrong train)

Extraneous: unintentional action (ex. bumping into equipment, dropping tools)

02/18/94
REVISION 1

**Contributing
Factors:**

Focus on the error when it was committed not when it is discovered. This may require some level of interpretation. If available information is insufficient to make a determination, select "Information unavailable"

Contributing factors definitions:

Inadequate training: training not sufficiently detailed or not specific.

Improper training: wrong information presented in training (ex. training taught task differently than how task is performed at the plant)

No training: no training presented

Procedure not followed: worker failed to follow (failed to take procedure to the work site, brought wrong procedure to the work site, abandoned use of the procedure) **failed to use adequate self-checking**

Procedure inadequate: procedure less than adequate due to problems with format, content, equipment identification, and/or quality of graphics

Lack of procedure: no procedural guidance available

Procedure wrong: procedure contains wrong information, wrong sequence of steps, wrong equipment identifications, does not reflect current plant configuration.

Human system interface: less than adequate: labels, arrangement or placement on panels or controls, information on a display, panel design

Work environment: less than adequate lighting, excessive noise, temperature extremes, cramped work space, radiological conditions

Verbal communication: missing or less than adequate verbal communication

Written communication: work order packages, technical specifications

Work Schedule: shift length, excessive overtime

Work load: too many things to do, pressure to maintain schedule

Management and Planning: Original design/installation errors that should have been detected through surveillance, inspections, etc,

Shift turnover: less than adequate or no turnover

02/18/94
REVISION 1

Plant Identified

Root Cause: Enter text from report if specified

Corrective

Actions: Enter text from report if specified

Type of Event: No data entry required

Cognitive Errors: Focus on the error when it was committed not when it is discovered. This may require some level of interpretation. If available information is insufficient to make a determination, select "Information unavailable"

Personnel

Effect Code: No data entry required

Reportability

Code: Select all that are marked on LER

Personnel

Activity Code: No data entry required

LER DATA ENTRY SHEET

Plant name: (as marked on LER and selected from
HFIS pick list)

Event date:(as marked on LER)

LER number:(as marked on LER)

Event time:

Power level:

Personnel category:

- licensed operator
- non-licensed operator
- instrument and control
- electrical
- mechanical
- engineer
- radiological protection
- chemistry
- security
- other

Work type:

- operating
- testing
- calibration
- troubleshooting
- maintenance
- engineering
- procedure development
- refueling
- modification
- other

Task behavior:

- skill
- rule
- knowledge

Action error:

- unavailable
- untimely action
- omission
- out of sequence
- wrong action
- extraneous action

Contributing factors:

- information unavailable
- inadequate training
- improper training
- no training
- procedure not followed
- procedure inadequate
- lack of procedure
- procedure wrong
- human system interface
- work environment
- verbal communication
- written communication
- work schedule
- work load
- management and planning
- shift turnover

Plant identified root cause:

(as marked on LER by coder)

Alternative root cause: (coder must specify here.)

Corrective Actions:

(as marked by coder)

Cognitive error:

- attention deficit
- misinterpreting information
- forgetting
- false assumption
- poor judgement
- boredom
- other

Reportability codes:

(as marked on LER)

Appendix F - HFIS Inspection Report Coding Instructions

Selecting Department

Department definitions:

Operations:	all licensed operators including RO and SRO, regardless of position. This category includes SS, STA, Non-licensed operators, rad-waste operators, auxiliary operators, plant equipment operators, fire department, work planning, outage planning, and project management group.
Instrument and control:	includes technicians referred to by this name; may also include those titled maintenance technicians or instrument technician. Tasks are usually associated with conducting surveillance or calibrating and functionally testing equipment
Electrical:	includes electricians and electrical maintenance personnel.
Mechanical:	includes mechanics and mechanical maintenance personnel.
Chemistry:	includes chemistry and radiochemistry technicians.
Radiation protection:	includes health physics, RP or HP technicians.
Engineer:	includes all types of engineers. (ie: design, plant support, system engineers)
Contractor:	includes all contractors regardless of area
Training:	includes all training personnel
QA/QC:	includes all QA/QC may include in-service testing and inspection, and non destructive testing personnel
Plant Management:	includes all management and supervisory personnel regardless of department
Planning & Scheduling	includes all staff in outage planning and work control

Selecting Area and Details for:

A. Training

Areas

A. Initial

if training is basic training leading up to initial qualifications

B. Continuing or requalification

if training present advanced topics or presents refresher training on basic topics

C. OJT

if training is job performance oriented and is leading to task qualification

D. Simulator

if training is conducted using a control room simulator

Details

01 No training

if the problem is due to no providing any training on a specific topic

02 Inadequate training

if the problem is due to incomplete or incorrect training

03 Training Process Problem

if the problem is due to a break down in the SAT (examples: inadequate job or task analysis, inadequate program evaluation or feedback, failure to keep lesson materials current)

04 Task qualification

if the worker is not qualified to do the job assignment

05 Individual knowledge LTA

if the individual worker completed training but was unable to put training into practice

Selecting Area and Details for:

B. Procedures & Reference Documents

Areas:

E. Normal

procedures related to all phases of normal plant operation including:

- corrective and preventative maintenance
- operation and response to transients
- radiological and decontamination

F. Off-normal

procedures related to refueling,

G. Emergency

all EOPs

H. Surveillance and test

procedures governing activities related to:

- testing of equipment.
- calibration
- troubleshooting

I. Administrative

procedures related to general activities such as:

- tagging
- scaffolding
- housekeeping
- configuration control

J. Special

procedures related to unique situations such as once in a plant life test, installation of modifications, QA/QC.

Details:

06 No procedure/reference document

if a document does not exist

07 Inadequate procedure/reference document

if a document exists but does not provide sufficient guidance for the worker to avoid error or

if the document contains incorrect information

08 Failure to follow procedure/reference document

if the document content is correct but the worker fails to follow the guidance or

09 Procedure/reference document development or maintenance program T A

if the document was developed using inadequate analysis or if has not been updated in either the original or in a specific copy.

10 Made an error using procedure/reference document

if the correct document was used but a step was skipped, misread or misinterpreted by the user

Selecting Area and Details for:

C. Organizational Issues

Area:

K. Staffing

if the issue is due to the number of workers or how they were used

Details:

11 Inadequate staffing

if the problem is due to inadequate number of workers

12 Poor task allocation

if the total number of workers was adequate but the way in which work was distributed was uneven or

if individual work overload, too many actions required at one time, too much information had to be processed concurrently

Area:

L. Overtime

if the issue is due to use of approved or unapproved overtime

Details:

13 Inadequate controls

if there is no guidance for approval and use of overtime or if the guidance is weak

14 Excessive number of hours worked

if the problem was caused by worker fatigue due to the number of hours worked or change in shift cycle

15 Frequent use of overtime

if there is no guidance to limit the amount of overtime or the conditions under which overtime may be used

Selecting Area and Details for:

D. Management and Supervision

Area: M. Attention and oversight
if the problem is due to management of a work activity

Details: 16 No supervision
if the problem is due to a lack of supervision
17 Inadequate supervision
if the problem is due to less than adequate supervision
if supervisor did not detect fatigue or fitness-for-duty problems
18 Management expectations LTA
if standards or expectations are not adequately defined or inconsistently enforced

Area: N. Work Control
if the problem is due to how work is assigned and managed

Details: 19 Scheduling and planning
if the problem is due to missing or inadequate scheduling or planning
(examples - bringing the wrong tools to the job)
20 Worker selection
if the problem is due to the fact that the worker is not qualified to perform the task

Area: O. Corrective Actions
if the current problem is because previous problems were not adequately addressed

Details: 21 Individual action less than adequate
if a specific fix was not completed or if completed, failed to prevent recurrence
22 Action not yet started
if a specific corrective action was previously identified but not yet begun
23 No action planned
if a previous occurrence did not identify any corrective action
24 Corrective action program LTA
if the overall program for identifying and correcting problems is inadequate

Area: P. Self-evaluation if the problem is due to inadequate or missing licensee evaluation

Details: 25 Root cause less than adequate if the root cause determination process does not identify true root causes

Selecting Area and Details for:

E. Communications

Areas:

Q Verbal

if the problem is related to instructions or information transmitted orally

R Written

if the problem is related to instructions or information other than that in procedures which is transmitted in writing (examples: night orders, memos, operator aids for operation of equipment)

Details:

26 Misunderstood information

if the information is correctly stated or written but is not understood

27 Communication not timely

if the correct information is received late (example: starting a test before informing the control room) or if groups fail to cross check

28 Communication LTA

if information is missing key elements (examples: not specifying a particular train) or if the information is incorrect (misstating information - providing the wrong identification number for a piece of equipment) or if communication is confusing

29 No communication

if information is not shared at all or

if group fails to cross check when appropriate

Selecting Area and Details for:

F. Human System Interface

Area:

- S. Equipment
- T. Instrumentation and controls
- U. Displays
- V. Panel/work station layout
- W. Equipment
- X. Tools and materials

Details:

- 30 Labels less than adequate
 - if the wrong equipment is selected because of missing, wrong or difficult to read labels or
 - if language on label is inconsistent with language in the procedure
- 31 Information organization LTA
 - if the understandability of information (test/content) and identifiability with associated alarms, controls, displays is inadequate
- 32 Size, shape or coding LTA
 - if the size, shape, coding, or scale marking scheme is inadequate
- 33 Placement of location LTA
 - if the placement, location, spacing, or arrangement of alarm, control, display, panel or workstation, tools, materials or equipment are inadequate
- 34 Information format LTA
 - if the presentation of information on menus for CRT screens or large overview display panel are inadequate

Selecting Area and Details for:

G. Work Factors

Area: Work Practices

- Details:
- 35 Work practices or skill of the craft LTA
if the skill of the craft activities are not performed consistent with management expectations, safety significance of activity or industry standards
 - 36 Non-conservative decision making/questioning attitude LTA
if personnel fail to stop work or establish appropriate controls when presented with unfavorable or uncertain conditions
 - 37 Tag outs
if the problem is due to missing or incorrect tagging
 - 38 Pre-job preparation
if the pre-job briefing or walk thru was missing or inadequate
 - 39 Work package quality
if the work package is missing information or if the information contained in the package is incorrect

Area: Z Work Environment

- Details:
- 40 Temperature
if the problem is due to temperature or weather conditions
 - 41 Light
if the problem is due to level of lighting, glare or wrong color lighting
 - 41 Noise
if the problem is due to distracting noise level
 - 42 Radiation
if the problem is due to work practices required because of the radiation level or
if performance of the task was made difficult by requirements of worker to wear protective clothing
 - 43 Work Area/Layout
if the problem is due to limited access to equipment or controls or
if the work area is small or
if there is insufficient space to perform the task

Area: AA Attention

Details: 45 Independent verification/plant tours LTA
if personnel fail to identify errors through independent verification or
perform verifications inconsistent with management expectations or
industry standards

46 Attention/self-checking LTA
if personnel become distracted, fail to verify appropriate actions prior to
taking action