CCS-109

Southern Nuclear Company
Nuclear Management Guideline (NMG)

United States Nuclear Regulatory Commission Official Hearing Exhibit			
In the Matter of:	Charlissa C. Smith (Denial of Senior Reactor Operator License)		
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NMP-GM-005-GL03
Human Performance Tools

Version 14.0
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Procedure Owner: Debbie Puckett / Fleet Human Performance Working Group Champion / Vogtle
(**Print:** Name / Title / Site)

Approved By: Original signed by Debbie Puckett on 03/29/2012
(Peer Team Champion/Procedure Owner's Signature / Date)

Guideline Version Description

Version Number	Version Description
9.0	• Editorial change to correct header, title change, and various typos.
10.0	• Editorial changes to correct title page format including removal of level of usage chart which is not applicable to guidelines, add reference to SOER 07-01 per Hatch CR 2010108587.
11.0	• Editorial change to correct page headers.
12.0	• Editorial change to correct page headers and typos. • Removed Records and Commitments sections Hatch CR 2010115098. • Deleted Responsibility section not applicable to a guideline. • Clarified at-risk practice for Peer Check regarding not referencing guiding document during self-checking for both performer and peer. • Revised Section 5.8 per Vogtle AI 2010207394. • Revised sections 4 and 5 of PJB checklist per Vogtle AI 2011200377. Added reference to JHA, ORA and RWP's. • Added Error Precursors Table to Attachment 5 • Revised Error Precursor / Recommended Actions in Attachment 5
13.0	• Version Description - Deleted bullet seven of revision twelve description comments. • Table of Contents – Updated to include Level 2 items (individual HU Tools). • Revised references section. • Revised definition of critical step. • Added to use the controlling document when performing peer checks. • Notes - Replaced job aids notes with one note at beginning and included handbooks as example of job aids. • PU&A - Deleted site specific procedure use and adherence guidance. • OMM - Added to verbalize. • PJB - Added note to clarify PJB is separate from other briefs. Revised when to use the Procedure Use and Adherence tool. • Added other times at which S.T.A.R. can be used (Step 5.7.2) • Task Preview - Revised PJB/Task Preview section to provide specific details regarding Task Preview to include verification of qualifications • Attachment 2 – Revised Items 10 and 11. • Attachment 4 - Added Post Job Configuration control questions. • Attachment 5 - Added Supervisor Hold Points as a strategy for mitigating Time Pressure.
14.0	• Task Preview – Revised Task Preview section to clarify details • Time Out – Clarified who to contact following use of the Time Out tool • Removed PJB and Task preview information under Peer Check tool • Added additional details of How to use the Peer check tool • Added Medium risk the Task Preview table • Clarified details of Task Preview requirements • Clarified PJB purpose and PJB requirements for reader-doer method • Added reader-doer requirements • Clarified contents of Time – Out • Clarified OMM At risk practices • Clarified How to use Questioning Attitude and associated at risk practices • Revised configuration control question

Table of Contents

1.0 Purpose

The purpose of this guideline is to identify the core set of Human Performance error reduction tools that will be applied at all Southern Nuclear Operating Company (SNC) sites. It identifies when the Human Performance tools will be used, the error precursors that may lead up to the event, the consequences of not using the human performance tools, and at risk practices to avoid.

2.0 Applicability

This procedure applies to the entire SNC workforce, site and corporate, as well as contractors and vendors who perform work at SNC facilities.

3.0 References

3.1 INPO Human Performance Tools for Workers, INPO 06-002

3.2 INPO Human Performance Reference Manual, INPO 06-003

3.3 INPO Human Performance Key Performance Indicators, INPO 08-004

3.4 INPO Human Performance Tools for Managers and Supervisors, INPO 07-006

3.5 INPO Managing by Experience, Some Management Principles for Preventing Events (Guideline), INPO 98-003

3.6 Southern Nuclear Safety & Health Manual

3.7 NMP-GM-005, SNC Human Performance Program

3.8 NMP-AD-018-F01, Meeting Observation Form

3.9 NMP-DP-001, Operational Risk Awareness

3.10 NMP-OS-007, Conduct of Operations

3.11 NMP-AD-006, Infrequently Performed Tests and Evolutions

3.12 NMP-SH-010-001, Job Hazard Analysis

3.13 INPO 11-003, Guideline for Excellence in Procedure and Work Instruction Use and Adherence Guideline

3.14 NMP-AP-003, Procedure and Work Instruction Use and Adherence

3.15 NMP-OS-002, Verification Policy

3.16 SOER 07-1, Reactivity Management

3.17 SOER 03-1, Emergency Power Reliability

4.0 Definitions

4.1 **At-risk Practice** – A behavior, belief, assumption, or condition that tends to diminish the effectiveness of the tool.

4.2 **Critical Activity** –An activity, if performed improperly, will cause irreversible harm to plant equipment or people or will significantly impact plant operations.

4.3 **Critical Step** – A procedure step, series of steps, or action that will cause irreversible harm to plant equipment or people or will significantly impact plant operation if performed improperly.

4.4 **Error-Likely Situation** - A work situation in which there is greater opportunity for error when a specified action or task is performed due to the presence of error precursors.

4.5 **Error-Precursors (Risk Factors)** – Task related conditions related to a specific activity or task that provoke human error, increase the chance of a technical error or an adverse consequence.

4.6 **Latent Error** – An error, act, or decision that unknowingly creates an undesired condition(s). It may be embedded in a process, culture, plant configuration of systems, structures, or components or the design bases, or reduces equipment reliability that remains undetected until revealed by subsequent operational activities.

5.0 Guidance

NOTE: Job Aids such as plastic lanyard cards or handbooks may be made available to personnel to enhance use of human performance tools.

The guidance is divided into sections, one for each human performance tool. Each section is divided into four subsections. The first subsection provides a background and/or purpose of the tool. The second subsection describes when to use tool. The third subsection provides guidance on how to use the tool. And finally, the fourth subsection lists at risk practices to avoid for each tool. Some tools are a combination of tools as described in INPO 06-002. For example, Task Preview is combined with Pre-Job Briefing and Questioning Attitude is combined with One Minute Matters.

5.1 Peer Check

5.1.1 The purpose of the Peer Check tool:

The purpose of Peer Check is to prevent an error by the performer, similar to concurrent verification (CV) but less formal. This technique takes advantage of a fresh set of eyes not trapped by the performer's task-focused mind-set. The peer, an individual familiar with the activity, may see hazards the performer does not see.

NOTE:	Use of the Peer Check tool is not required where concurrent verifications are in place.

5.1.2 When to use the Peer Check tool:

Use the Peer Check tool any time improper manipulation could result in plant transients, equipment damage, or personnel injury.

Opportunities for using the peer check tool for step or actions will be identified during the Pre-Job Briefing / Task Preview.

Peer Check tool will be used when performing the activities listed below:

- Critical steps
- Reactivity manipulations
- Irreversible or otherwise unwanted actions
- Comparisons of test data with acceptance criteria
- Start or stop of major components
- Return or removal from service
- Identification of correct parts or correct component before maintenance
- During installation of similar components or parts that could be interchanged or installed incorrectly
- Error-likely situations related to important actions

To be consistent from crew to crew the following is a clarification of the expectations of using the Peer Check tool in the Main Control Room (MCR):

- These instructions are for "daily activities" which means during normal operations. During transients or emergency response situations, the Peer Check tool should be used as much as possible but tempered with actions that need to be taken.
- ***For Farley and Vogtle,*** *all* pump starts from the Main Control Board (MCB) are expected to be completed using a Peer Check. This does not include starts from the BOP or radiation monitor racks. This is on the MCB proper only.
  For Hatch, *all pump starts from the main control room front panels are expected to be completed using a Peer Check.*

5.1.3 How to use the Peer Check tool:

- The performer self-checks the correct component which includes comparing it to the controlling document.
- The peer self-checks the correct component which includes comparing it to the controlling document.
- The performer and the peer agree on the action to take and on which component.
- The peer observes the performer before and during execution to confirm the performer takes the correct action on the correction component.
- The performer executes the intended action on the correct component.
- If the performer's action is inconsistent with the intended action, the peer stops the performer.
- If the performer's action is consistent with the intended action the peer informs the performer that the action taken is correct.

5.1.4 At-risk practices to avoid:

- Peer is inexperienced with the task.
- Peer is not paying close attention to the performer.
- Peer is unable to view the component.
- Peer is significantly junior to the performer and may be reluctant to correct the performer.
- Peer is not prepared to prevent an error by the performer.
- Peer assumes the performer will not make a mistake.
- Performer acts before the peer is ready to perform the peer check.
- Performer and peer swap roles during the task.
- Performer or peer does not self-check rigorously, assuming the other person will.
- Performer or peer uses verbal cues or observed actions of the other individual instead of personal confirmation or self-checking.
- Performer is less attentive to the action, believing the peer will catch any problems.
- Performer asks another person to peer check, when that person is already engaged in a risk-important activity (such as transients).
- Peer Check is over-used, eventually leading to complacency by both parties.
- Performer or peer self-checking without referencing the guiding document.

5.2 Task Preview and Pre-Job Brief

After a task has been assigned the worker or workers assigned to perform the task prepare for the task using Task Preview. Based on the guidance in the table below, a Pre-Job Briefing may be required after completion of the Task Preview.

	Low Risk	Medium and High Risk
Simple or Repetitive Activity	Task Preview (including a review of safety hazards and safety requirements)	Tailored Pre-Job Briefing (starting with a standard briefing checklist)
Complex or Infrequent Activity	Standard Pre-Job Briefing (using a standard briefing checklist)	Infrequently Performed Test or Evolution (See SOER 91-1.)(NMP-AD-06)

Low-Risk and Simple/Repetitive activities usually involve the assigned worker mentally walking through the task preview before starting the job. There may be critical steps, but the potential harm is minor.

Low Risk and Complex /Infrequent work activities need only standard but thorough guidance specific to the job. There may be critical steps, buy the potential for harm is minor.

5.2.1 Task Preview

5.2.1.1 The purpose of Task Preview:

The task preview prepares the worker to perform a job right the first time. It provides a structured, risk-based review of the work activities from a human performance perspective and it enhances the individual's situational awareness while in the field.

5.2.1.2 When to use Task Preview:

- Before attending a pre-job briefing
- Before starting an uncomplicated, repetitive, low risk job
- After extended delays in an activity
- Following task interruptions

5.2.1.3 How to use Task Preview

5.2.1.3.1 Before attending a pre-job briefing or starting work, workers verify qualifications, review procedures and other related documents to familiarize themselves with the scope of work, task sequences, and critical steps. Workers may want to walkdown the job site or talk with those who performed the job in the past. BCM

5.2.1.3.2 The worker identifies the critical steps, possible errors for each one, and likely consequences. It is also worthwhile to consider the "worst that could happen." Once the errors and consequences are identified, appropriate human performance tools can be considered.

Note:	Previous experience, addressed during a task preview, is not limited to industry operating experience. It may include lessons learned from fleet events, equipment work history, and even personal experience. While considering relevant previous experience, workers think about how they will personally prevent similar errors.

5.2.1.3.3 Perform a SAFER analysis:

- **S**ummarize the critical steps.(when applicable)
- **A**nticipate errors for each critical step and relevant error precursors.
- **F**oresee probable and worst-case consequences should an error occur during each critical step.
- **E**valuate methods to prevent and catch errors as well as related compensatory actions to mitigate identified risk factors and contingencies to prevent/mitigate adverse consequences.
- **R**eview previous experience and lessons learned relevant to the specific task and critical steps. BCM

5.2.1.4 At- risk practices to avoid:

- Not allowing workers time to review procedures/work documents
- Participants not prepared for the task
- Addressing human performance tools in generalities vice specifics
- Omitting a discussion of, or not identifying specific controls for, each critical step
- Workers failing to express concerns they may have
- Not using lessons learned from previous activities for the task
- Only performing a Task Preview for tasks that also require a Pre-Job Brief.

5.2.2 Pre Job Briefing

5.2.2.1 The purpose of the Pre-Job Briefing tool

The purpose of the Pre-Job Briefing tool is a meeting of workers and supervisors (when applicable) conducted before performing a job to discuss the tasks involved, hazards, and related safety precautions. This helps individuals to better understand what to accomplish and what to avoid. Pre-Job Briefings help participants avoid surprises in the field and reinforce the idea that there are no 'routine' activities.

5.2.2.2 When to use the Pre-Job Briefing Tool:

- Before starting a job
- Once per shift, if the activity exceeds one shift in duration
- After extended delays in an activity, to include breaks, lunch, shift-turnovers

A Pre-Job Briefing will be performed when required by NMP-DP-001, "Operational Risk Awareness," or as deemed appropriate by the immediate supervisor or lead individual. A Pre-Job Briefing will be held for activities that include any of the following aspects:

- Performance of a special purpose procedure for a safety-related activity.
- Performance of a procedure where the potential for personnel injury exists due to high risk activities (i.e., climbing, high temperature, heavy load lifts, rotating machinery, etc.) or the potential for significant equipment damage exists.
- Performance of a procedure involving potential radiological release or individual exposures expected to be greater than 100 mrem.
- Performance of a procedure needing coordination / communications due to workers in different locations.
- Performance of procedure needing coordination due to the complexities of the evolution required or involvement of more than one group.
- Complex evolutions that may affect core reactivity, either directly or indirectly, such as removing a feedwater heater from service.
- Performance of procedure involving activities with a high probability of initiating a transient.
- Performance of procedure involving activities with a high personnel error potential.
- Non-routine tasks performed less frequent than weekly (for example: monthly, semi-annual, etc.).
- Performance of procedure using the reader-doer method

NOTE: The Pre–Job Briefing is separate from ALARA Briefings, IPTE, morning meetings, and Task Previews.

5.2.2.3 How to use the Pre-Job Briefing Tool:

When preparing for a Pre-Job Briefing, the items listed on Attachment 2 shall be considered and included when applicable for the task. In addition, items listed on Attachment 3 should be considered for activities performed by the Operations department. Attachment 5 lists the error precursors outlined in the T.W.I.N. analysis and includes error prevention strategies to mitigate error precursors.

Canned or Tailored – Pre-defined or Template Pre-Job Briefings may be used and shall include the elements listed on Attachments 2 and 3 as applicable.

For evolutions that are considered infrequently performed, refer to procedure NMP-AD-006, Infrequently Performed Tests and Evolutions for appropriate details and guidelines for using in conjunction with the appropriate Pre-Job Briefing.

The Pre-Job Briefing should be scheduled to avoid interferences with shift turn-overs. The Pre-Job Briefing should be held in a suitable area that allows good communication and avoids interruptions. Supervision must take care to remove all potential distractions. When distractions cannot be removed, extra care must be taken to ensure clear communications and understanding within the briefing team.

The Pre-Job Briefing will be led by a worker/supervisor who is directly involved in the work activity. When the evolutions extend into the next shift or involves personnel who must be relieved, the need for additional briefings with the new personnel should be considered.

A Pre-Job Briefing for evolutions involving operation of safety-related equipment should be coordinated with Operations to determine (and incorporate as applicable) their participation in the Pre-Job Briefing.

During the Pre-Job Briefing, a determination for a post-job review shall be determined and communicated by the job supervisor. The communication shall include the time and location of the Post-Job Review as applicable. Note that a Post-Job Review may also be required by NMP-DP-001, “Operational Risk Awareness.” See attachment 4 for items to be covered in a Post-Job Review.

5.2.2.4 At–risk practices to avoid :

- Conducting the meeting as a monologue, without active participation by the assigned worker(s).
- Discussing human performance tools in generalities.
- Workers failing to express their concerns or ask questions.
- Holding separate briefings for principal workers.
- Using a “cookbook” approach to the briefing covering every item on the pre-job briefing checklist regardless of its applicability.
- Being insensitive to how mind-sets or expectations may disguise problems and warning signals.
- Not assigning individual-specific responsibilities for contingencies and abort decisions.
- Supervisors leading pre-job briefings instead of the lead worker.
- Holding briefings longer than 30 minutes, which could promote inattention and lack of interest.
- Not considering equipment work history or the worker's personal experience as relevant sources of operating experience.
- Not considering the worker's proficiency with the task to determine if the task is performed infrequently.
- Covering operating experience irrelevant to the task.
- Leaving out critical information in the Pre-Job Briefing or the bases for decisions.
- Conducting the Pre-Job Briefing in a hurry.

5.3 Three-Part Communication

5.3.1 The purpose of the Three-Part Communication tool:

The verbal exchange of information, especially face-to-face, is the most frequent form of communication. However, verbal communication possesses a great risk of misunderstanding. Understanding communication can be critical. Use Three-Part Communication to verify that communication was heard and understood. Do not assume that the other party hears what you said correctly. The weakest link of a communication is often the third leg, because the sender may assume the receiver heard the message if not confirmed or corrected by the sender by means of the third leg.

5.3.2 When to use the Three-Part Communication tool.

Verbal conversations involving:

- Operation or alteration of plant equipment
- Condition of plant equipment or the value of an important parameter
- Performance of steps or actions using an approved procedure
- Task assignments that impact plant equipment or plant activities
- Safety of personnel, the environment or the plant

5.3.3 How to the use the Three-Part Communication tool:

5.3.3.1 Sender states the Message (Message)

- Obtain the attention of the intended Receiver.
- State the message clearly and concisely.

5.3.3.2 Receiver acknowledges the sender (repeat back)

- Repeat direction / request back to the Sender in own words.
- If you question or do not understand the sender's directions, then reconfirm the instructions with the sender.
- Repeat word for word, equipment designators and nomenclature.

5.3.3.3 Sender Responsibilities (Confirmation) acknowledges the receiver's reply

- If satisfactory, confirms the Receiver's repeat back if satisfactory.
- If not satisfactory, respond with "that is wrong" or similar and repeat original communication to the Receiver until the message is understood.

5.3.4 At-risk practices to avoid:

- Sender not getting Receiver's attention.
- Sender speaking from behind the Receiver or not making eye contact when it is practical to do so.
- Sender not taking responsibility for what is said and heard.
- Sender or Receiver not stating his or her name and work location when using a telephone or radio.
- Sender attempting to communicate with someone already engaged in another conversation.
- Sender stating too much information or multiple actions in one message.
- Sender not giving enough of the information that the Receiver needs to understand the message.
- Sender not verifying Receiver understood the message.
- Receiver reluctant to ask for clarification of the message.
- Receiver taking action before the communication is complete.
- Receiver not writing the message on paper if there are more than two items to remember.
- Receiver giving information unrelated to the immediate task.
- Receiver mentally preoccupied with another task.
- Overusing the tool for non-operational communications.
- Not using three-part communication in order to expedite the task.
- Message not being stated loudly enough to be heard.
- Enunciating words poorly.
- Conflict between *what* is said (content) and *how* it is said (feelings).

5.4 Phonetic Alphabet

5.4.1 The purpose of the Phonetic Alphabet tool:

The purpose of the Phonetic Alphabet is to reduce errors in communication. By using a standard conversion of a word for a letter, so confusion can be eliminated for letters with similar sounds.

5.4.2 When to use the Phonetic Alphabet tool:

- To communicate information to ensure understanding when part of the message contains a letter or letters.
- When specifying train, phase, and channel designations
- When the sender or receiver might misunderstand, such as sound-alike systems, high noise areas, poor reception during radio or telephone communications

5.4.3 How to use the Phonetic Alphabet tool

NOTE:	The following steps are required minimums for use of the Phonetic Alphabet tool**.** It is acceptable, but not mandatory to phonetically pronounce each letter.

5.4.3.1 Equipment should be identified by its unit, common name, and train as appropriate. It is not desired to phonetically spell or say common, standard terminology or abbreviations such as Residual Heat Removal (RHR), Chemical and Volume Control System (CVCS), Digital Rod Position Indication (DRPI), Pressure Valve (PV), Hand Valve (HV), etc.

5.4.3.2 When referring to equipment by tag number, the common portion does not need to be phonetically pronounced, but the train and other unique portions should be using the following table. It is recommended that the noun name be included when appropriate with the specific identifier for clarity.

A – Alpha	**B – Bravo**	**C – Charlie**	**D - Delta**
E – Echo	**F – Foxtrot**	**G – Golf**	**H – Hotel**
I – India	**J – Juliet**	**K – Kilo**	**L – Lima**
M - Mike	**N – November**	**O – Oscar**	**P – Papa**
Q – Quebec	**R – Romeo**	**S – Sierra**	**T – Tango**
U – Uniform	**V – Victor**	**W – Whiskey**	**X – X-ray**
Y – Yankee	**Z - Zulu**		

Examples:

- Written – “1HV8804B” Stated – “One HV Eight Eight Zero Four Bravo”
- Written – “1LV112E” Stated – “One LV One Twelve Echo”
- Written – “DG1A” Stated – “Diesel Generator One Alpha”
- Written – “N1P15V056B” Stated – “N One P One Five V Zero Five Six Bravo”

5.4.4 At-risk practices to avoid:

- Not using the phonetic alphabet when communicating orally for equipment label designations, safeguard trains, electrical phases, or channel designations.
- Using slang terms instead of specific or standard terms.

5.5 Procedure Use and Adherence

5.5.1 The purpose of Procedure Use and Adherence tool:

Procedure Use and Adherence is the act of performing or meeting the requirements of a procedure, recognizing deficiencies in a procedure, and stopping work if the procedure cannot be safely followed. In addition to the activities performed to accomplish the purpose of the procedure, the user must comply with the initial conditions, precautions and limitations, and acceptance criteria that are applicable to the function(s) being performed. This is especially necessary if performing only a portion(s) of a procedure. Not complying with the applicable requirements could result in violation of a commitment or in damage to plant equipment.

Procedure adherence means understanding the procedure's intent and purpose and following its direction. The user performs all actions as written in the sequence specified by the document. If it cannot be used as written, then the activity is stopped, and the procedure is corrected before continuing. Following the procedure without question does not guarantee safety because procedures sometimes contain hidden flaws. Understanding the overall purpose and strategy of the procedure promotes safer outcomes.

Procedure use denotes the degree or level of reference by the user versus the level of dependence on the user's memory and recall. Level of use (Continuous, Reference, and Information) designation takes into account the task's risk and complexity, the importance of the equipment, as well as the work group's (individuals) experience and proficiency with the task.

5.5.2 When to use the Procedure Use and Adherence tool:

- For guidance on this tool refer to NMP-AP-003.
- When manipulating, altering, monitoring, or analyzing equipment
- When a procedure exists for a work activity
- When no procedure exists, but there should be (STOP and get help)
- When required by technical specifications or other technical documents

5.5.3 How to use the Procedure Use and Adherence tool:

- Determine expected response to actions before performing assigned tasks.
- Verify expected responses are received after action has been taken.
- Understand the safety and regulatory implications described in the “Precautions and Limitations” section of the procedure if applicable.
- Use the current revision of the correct procedure, including temporary changes in effect.
- Review the procedure prior to use to ensure it is appropriate for use under present conditions and to be aware of procedural requirements.
- Steps in Continuous Use and Reference Use procedures are to be followed in sequence.
- For procedures that do not have signoffs after each step, placekeeping techniques should be used to ensure procedure steps are not skipped.
- Follow the assigned Level of Use for the activity being performed (Continuous Use, Reference Use, or Information Use).
- Perform procedurally controlled activities with a Questioning Attitude to determine if the procedure is adequate for the activity.
- Provide feedback to appropriate immediate supervision on procedure problems and revise the procedure or initiate changes for procedural problems, via the Corrective Action Program.
- Evaluate procedure problems and ensure appropriate corrective measures are taken prior to and during use of these documents.

NOTE: Do not attempt to perform work with a procedure that is incorrect. Take a TIME OUT to notify your supervisor and correct the procedure problem.

- If the procedure appears to be incorrect, stop and notify supervision.
- If concurrent verification or peer-checking is required for a step, the reader and the doer should transition to a performer and verifier role.

5.5.4 At-risk practices to avoid:

- Assuming a procedure is well written and accurate.
- Not reviewing a procedure before performing a job.
- Commencing a procedure without establishing initial conditions.
- Performing a procedure step without understanding its purpose.
- Not submitting feedback (technical accuracy and usability).
- Performing a procedure without knowing critical steps.
- Using an attachment or data sheet in place of the procedure.
- Using a procedure for a task that the user is not qualified for.
- Believing “A good operator doesn't need a procedure”.
- Using multiple procedures at the same time.
- Using a “reader-doer” method at critical steps.
- Not knowing immediate actions from memory (operators).
- Skipping steps or segments of a “routine” procedure, because those steps have been “unnecessary” in the past.
- Using a previous, superseded revision of a procedure.
- Marking steps “N/A” (not applicable) without prior authorization.
- Following a procedure knowing it will cause harm if followed as written.
- Using a procedure, or segment of a procedure, for a task other than that intended by the procedure.

5.6 Time Out

5.6.1 The purpose of the Time Out Tool:

The use of the Time Out Tool involves a brief stoppage of the task to discuss task-specific conditions and assumptions with the intent to create a shared understanding of the task, work environment, and conditions based on real data. Every person has the responsibility and authority to STOP work when uncertainty persists.

Use of the Time Out Tool is encouraged. Don't feel rushed into performing an evolution and not call a needed Time Out.

Contact and involve supervision or other knowledgeable person in the decision to proceed.

The key to successfully using the Time Out tool to enhance human performance is recognizing when to call a Time Out.

5.6.2 When to use the Time Out Tool:

- When additional coordination needs arise.
- When additional resources are necessary to successfully complete the task.
- When errors are found in procedures.
- If beyond the scope of the plan or process.
- If inexperienced or lack knowledge regarding the task.
- When someone else expresses doubt or concern.
- When uncertainty, doubt, confusion, or questions persist.
- If outside of conditions assumed by a technical procedure.
- When encountering conditions inconsistent with the procedure.
- When outside the bounds of key parameters.
- When feeling distrustful of another individual.
- When unexpected results or unfamiliar situations are encountered.
- When something expected does not happen.
- When uncertain regarding compliance with expectations or procedures.
- When unfamiliar with an important work situation.

5.6.3 How to Use the Time Out Tool:

- State out loud "Time Out."
- State the reasons that the Time Out was called.
- Place the equipment and the job site in a safe condition.
- Notify your immediate supervisor or the responsible supervisor for the activity.
- It may be beneficial to seek assistance from individual's with the experience or expertise with the situation.
- Do not proceed unless all questions / concerns are resolved.
- Once all questions / concerns have been addressed, state out loud "Time In."

5.6.4 At-risk practices to avoid:

- Feeling rushed to perform an evolution and not calling a needed Time Out.
- Dismissing contrary evidence or points of view.
- Discounting the concerns of less experienced individuals.
- Not asking for help from more knowledgeable persons.
- Not asking for help for fear of embarrassment.
- Feeling inadequate for having to ask for help.
- Emphasizing “who is right” instead of “what is right”.
- Thinking the task is “routine” or “simple”.
- Believing nothing bad can happen.
- Assuming “skill of the craft” is sufficient to address a situation.
- Not having clear criteria.
- Being unaware of critical attributes or critical parameters.
- Answering one’s own questions regarding a critical step.

5.7 Self-Verification (STAR)

5.7.1 The purpose of the Self-Verification (STAR) tool:

Helps focus the performer's attention on the appropriate task or action, to understand the expected outcome *before* acting and to verify the results after the action.

5.7.2 When to use the Self-Verification (STAR) tool:

- When manipulating or altering plant equipment or controls
- When entering plant data into a computer or recording it on a form
- When performing a calculation
- When revising drawings or procedures using cut-and-paste on a computer or by making handwritten annotations (pen and ink)
- Prior to and during an impending change in equipment status
- When assembling components that contain similar parts that potentially could be interchanged
- Ensuring closure of vital area and fire doors
- During lifting and rigging activities

5.7.3 How to use the Self-Verification (STAR) tool:

STOP – Pause.
- Focus attention on the task's immediate objective
- Eliminate distractions

THINK – Understand what will happen.
- Confirm the action to be taken is appropriate understanding the expected responses of the action.
- Consider any contingency.
- If uncertain – Call a Time Out.
- Point at or touch the component label or tag to identify the correct unit, train, and compare it to the controlling document.

ACT – Perform the correct action.
- Without losing physical or visual contact with the component identified, perform the intended action.

REVIEW – Confirm anticipated result obtained.
- If an unexpected response is obtained, then take actions as previously determined in the Pre-Job Briefing or procedure. Otherwise, place the equipment in a safe configuration and call a TIME OUT.

5.7.4 At-risk practices to avoid:

- Not understanding the intent of a procedure step before performing it.
- Self-checking without referencing the guiding document.
- Performing several manual actions in rapid succession.
- Performing more than one action at a time.
- Performing the action when uncertainties or discrepancies exist.
- Talking with another person while performing the action.
- Looking at something other than the component being manipulated.
- Not self-checking again after losing visual or physical contact.
- Not knowing if the action is a critical step.
- Feeling sleepy or fatigued while performing a critical step.
- Not taking the time to confirm that results are correct.
- Not self-checking when flagging is used.

5.8 Situational Awareness / One Minute Matters / Questioning Attitude

Situational Awareness is the on-going assessment of the environment and the conditions surrounding a worker as work is performed. Situational awareness demands the individual to clearly understand the job requirements, the equipment conditions, and work environment before acting. If any hazard is encountered or there is any uncertainty or confusion, a time out is called and the work is stopped. The hazard or situation is addressed before the worker continues with the task. Setting a tone of uneasiness sensitizes a worker to detect unsafe conditions he or she may not see otherwise. Situational awareness includes the use of One Minute Matters (OMM) and Questioning Attitude.

5.8.1 One Minute Matters

5.8.1.1 The purpose of the One Minute Matters tool:

One Minute Matters is used to improve a person's situational awareness. When first arriving at the job site, take as much time as needed to help develop an accurate understanding of critical indicators, equipment condition, work environment, hazards, and team members. This helps people establish a healthy sense of uneasiness, boosting their questioning attitude and enhancing the accuracy of their situational awareness. If any hazard is encountered or conditions of the work environment are not as expected, a time out is called to correct any deficiencies.

5.8.1.2 When to use One Minute Matters:

- Upon arriving at the physical work location.
- Upon changing work locations.
- After extended breaks or interruptions, such as lunch.
- Prior to interaction with risk-important equipment.
- During a walk down of a work package.
- When a potential safety hazard is present.

5.8.1.3 How to use One Minute Matters:

Upon arriving to the job location or upon changing work locations:

- State aloud the OMM review.
- Take the time necessary to assess the field conditions of work area and adjacent surroundings.
- Verify that you are on the correct unit, train, system, and component (STAR).
- Review the area for safety hazards (lighting, trip points, pipe temperatures, etc.).
- Recognize sensitive equipment at the work area, or enroute, to avoid bumping or changing the configuration (pistol-grip & pushbutton switches, hand switches, ball-valves, etc).
- Ensure conditions are consistent with PJB and procedure or work instructions.
- Establish the right work tempo.
- Talk with coworkers and/or supervisor about unexpected conditions or hazards and the precautions to take.
- Eliminate hazards, install appropriate defenses, or develop contingencies before proceeding with the task.

5.8.1.4 At-risk practices to avoid for One Minute Matters:

- Hurrying, not taking the time to perform a One Minute Matters.
- Believing “routine” or “simple” means “no risk”
- Believing nothing bad can happen.
- Not talking about hazards or precautions with coworkers.
- Not talking about “gut feelings.”
- Not taking a Time Out when conditions are inconsistent with PJB and procedure or work instructions.

5.8.2 Questioning Attitude

5.8.2.1 The purpose of the Questioning Attitude tool:

A questioning attitude fosters situational awareness, encouraging thought about nuclear and personnel safety before action is taken. Being mindful of the work situation helps a person maintain an accurate understanding of work conditions at any given time, avoiding blind spots. This tool alerts people to imminent hazards, warning signs, and uncertainties in the work environment and encourages personnel to take a time out to resolve those hazards, warnings, or uncertainties before proceeding with the job. Any doubt must be followed up with the discovery of facts, not assumptions, to reveal more knowledge about the situation, which eliminates doubt. A good pre-job brief (PJB) enhances a person's questioning attitude. The PJB sensitizes a worker to what should be and what should not be. For more information on Questioning Attitude, refer to NMP-GM-005-GL06.

5.8.2.2 When to use the Questioning Attitude tool:

- During self-checking (Think step of STAR).
- Before performing an important step or phase of an activity.
- When making a decision about an important activity.
- When experiencing uncertainty, confusion, or doubt.
- When experiencing a "gut feeling" that "something is not right."
- When encountering unanticipated changes in conditions.
- When conflicts or inconsistencies exist between plans, procedures and actual conditions.
- After encountering unexpected results.
- After discovering missing information or resources.
- Upon hearing danger words:
    - "I assume"
    - "Probably"
    - "I think"
    - "Maybe"
    - "Should be"
    - "Not sure"
    - "Might"
    - "We've always…"

5.8.2.3 How to use Questioning Attitude:

- Proactively search for work situations that flag uncertainty by:
  - Periodically pausing to check the work location
  - Pausing when a flag is recognized
  - Identifying inconsistencies, confusion, uncertainties, and doubts.
  - Stating the uneasiness or question in clear terms.
- Gather relevant information:
  - What are the “knowns” and “unknowns”?
  - Use independent, accurate, and reliable information sources, especially other knowledgeable persons.
  - Compare the current situation (knowns) with independent sources of information.
  - Consider “what if …?” and / or use a “devil’s advocate” approach in a spirit of helpfulness.
  - Identify persistent inconsistencies, confusion, uncertainties, and doubts.
  - Validate assumptions. Do not rely on assumptions as facts.
- Continue the activity if the uncertainty has been resolved with facts. Do not proceed in the face of uncertainty.
- If inconsistencies, confusion, uncertainties, or doubts still persist use Time Out tool.

5.8.2.4 At-risk practices to avoid for Questioning Attitude:

- Not pausing periodically to refresh your understanding of the work situation.
- Proceeding with a task when questions exist.
- Being unaware of critical parameters or margins.
- Believing nothing can go wrong.
- Believing “routine” or “simple” means “no risk”
- Not Validating Assumptions.
- Trying to make reality conform to your expectations (mental model) rather than seeing what is really around you.
- Rationalizing doubts, uncertainties, contradictory information, subtle differences, or anomalies.
- Not asking questions when subtle cues suggest disorientation is occurring.
- Accepting the first thing that comes to mind, initial impressions, or assessments as factual.
- Ignoring subtle differences or apparently minor inconsistencies.
- Not understanding the basis of the procedure step.
- Not considering the likely effects of taking or not taking an important action.
- Allowing emotions rather than reason to guide decisions.
- Accepting supporting evidence without questioning its validity.

Attachment 1 – Other Human Performance Tools as defined in INPO 06-002

INPO 06-002 describes several human performance tools commonly used in the commercial nuclear power industry. The tools describe a set of discrete behaviors to help workers perform their activities more reliably. The tools provide a proven technique to help anticipate, prevent, or catch active errors before they cause harm to person, plant, or property.

This list is provided to identify the human performance tools defined by INPO. Most of the tools are defined in this instruction but may be called a different name within SNC, e.g. INPO "Job-Site Review" is equivalent to SNC "One Minute Matters." For complete descriptions and explanations, see INPO 06-002.

Fundamental Human Performance Tools

*Task Preview (included in PJB)
*Job-Site Review (OMM)
*Questioning Attitude (included in OMM)
*Stop When Unsure (Time Out)
*Self-Checking (STAR)
*Procedure Use and Adherence
*Phonetic Alphabet
*Three-Part Communication

Conditional Human Performance Tools

*Pre-Job Briefing
*Concurrent Verification
*Independent Verification
*Peer Checking
*Post Job Review (included in PJB)
*Placekeeping (included in Procedure Use and Adherence)
*Flagging
Turnover

***SNC Adopted Human Performance Tools**

Attachment 2 – Pre-Job Briefing Agenda (PJB)

NOTE: PJB is separate from ALARA Briefings, IPTE, morning meetings, and Task Previews. PJB shall be led by the lead worker, if assigned, otherwise, a supervisor. Prior to conducting a PJB, confirm all required participants are present and have completed the task preview.

1. **Task purpose, scope, and nature of work**
2. **Review of documents**
   - Review the procedure / clearance / task to be performed including level of use.
3. **Task assignments**
   - Discuss roles and responsibilities, qualifications, personal limitations, handoffs, and the controlling authority.
4. **Safety hazards and mitigating methods**
   - Discuss safety hazards and mitigating methods. If ORA is rated high in personnel safety, discuss using Job Hazard Analysis.
   - Discuss special precautions and personal protective equipment (PPE) required.
   - Discuss ALARA and radiation work permit requirements.
   - Discuss control of energy sources including permits and clearances.
   - Designate Safety Coach.
5. **Human performance**
   - If activity is medium or high risk, discuss actions for managing risk per ORA process.
   - Address HU tools for each critical step relevant to risks with nuclear, industrial, radiological, and environmental safety as well as risks to operations/production
   - Summarize the critical steps.
   - Anticipate errors for each critical step and relevant error precursors.
   - Evaluate controls or contingencies at each critical step to prevent, catch, and recover from errors, and to reduce their consequences.
   - Identify compensatory measures for first time performers of tasks, such as supervisor or peer oversight.
6. **Special requirements or unusual conditions (as applicable)**
   - Discuss coordination of activities with other work groups or personnel.
   - Discuss communication methods and contingencies.
   - Identify resources, tools and material needed to complete the task.
   - Discuss equipment/plant operating parameters that may be affected and the actions required for their proper monitoring and control (power, temperature, pressure, level, etc.)
   - Plant Status Control:
     - What will you do to ensure configuration control?
     - How does the controlling document return the component(s) and associated sub-component(s) to their required position?”
     - How am I going to prevent bumping components?
   - Discuss applicable Technical Specifications.
   - Identify and address FME concerns; Discuss housekeeping requirements.
7. **Operating experience**
   - Discuss relevant OE and Lessons Learned & mitigating actions to prevent recurrence.
8. **Stop-work criteria**
   - Review contingency actions to address unexpected conditions. Conservative decision making will be utilized.
9. **Oversight**
   - Discuss management or supervisory oversight needs.
10. **Questions and concerns** not previously discussed.
11. **Ask: “ What is the most likely undesirable outcome of this activity?”**

Attachment 3 - Operations Department Pre-Job Briefing Additional Topics

Note: Configuration of the components will be known prior to the PJB so that the PJB can be accurate in discussing what specific actions need to be taken.

1. If equipment is to be removed from service, ensure proper authorization is obtained based on the other OOS equipment.

2. Ensure current system status will allow this evolution.

3. Ensure no active clearances, temporary modifications or work in progress on affected systems will conflict with the activity.

4. Describe the objective of the evolution, initial conditions, sequence of events, and expected plant response identifying key plant parameters and/or annunciators that may require special attention.

5. Determine if any WO Functional Test can be done during this job.

6. Outline plant responses and actions needed to stabilize the system or unit or even plant shutdown.

7. For procedures that state a trip potential exist, perform following:
   - Identify the specific reason for trip potential
   - Determine what needs to be done to address the trip potential.

8. Review for preconditioning needs to be performed for IST surveillances.

Attachment 4 - Post-Job Review Topics

(Refer to NMP-DP-001 for any non-repetitive, infrequently performed High Risk Post-Job Review)

Errors that trigger significant events are organizational failures. Therefore, feedback on work preparation and work performance is very important information for management, as well as the "As-Left" status of equipment. Procedure and equipment problems and minor human error require management's attention. Such conditions tend to be latent in nature and accumulate within the organization if uncorrected. If workers do not communicate the information, managers miss an opportunity to improve. Post-job reviews provide management an opportunity to eliminate weaknesses with processes, programs, and policies that could challenge event-free plant performance.

The need for a post-job review shall be determined and communicated during the Pre-Job Brief by the job supervisor.

Examples of when post-job reviews should be considered:

- When completing any work in which complications occurred.
- After completing a non-routine or important work activity.
- After each high-risk phase of a risk-important project.
- At the conclusion of emergent work.
- After routine work and improvements were identified.
- After completing or turning over a task where component manipulations were made.

At Risk Practices to Avoid:

- Not performing a post-job review after working on risk important plant equipment.
- Principal workers not involved in the post-job review.
- No time allotted for the post-job review, or performing post-job review in a hurry
- No method of follow-up identified to address issues.
- No follow up with principal workers for high interest issues.
- Post-job review or follow-up not done face-to-face.
- Important issues not documented for reference for future Pre-Job Briefings.

Attachment 4 - Post-Job Review Topics (continued)

(Refer to NMP-DP-001 for any non-repetitive, infrequently performed High Risk Post-Job Review)

1. Review of task or evolution.

2. Review of documentation to include status of equipment restoration or configuration, completion of procedures and work instructions, clearances, and status of any parts removed.

3. Review of procedure or work instruction problems encountered (discrepancies, content, level of use, usability, quality) and how those procedure problems will be addressed (CR, marked up procedure forwarded to procedure group, feedback forms).

4. Discuss housekeeping status.

5. Discuss the things that went well that should be continued in future work.

6. Review and document any Lessons Learned via condition report to include adequacy of tools and resources, minor errors that were made during the activity, unanticipated job-site conditions and job workarounds.

7. If component manipulations were made, the following questions should be reviewed:

   - How am I ensuring the equipment is left properly aligned?
   - How am I documenting and communicating the “as left status” of the equipment?
   - How am I ensuring procedures in progress are tracked and completed?

Attachment 5 - Error Precursors and Error Prevention Strategies

To improve the ability of people to interact and address the concept of error-likely situation, it is easier to talk about error precursors using categories. Work can be described using attributes common to any work activity. Conditions, positive or negative, associated with the following attributes, commonly referred to as the **TWIN** analysis, can be used to accurately describe a specific work situation:

T ***T****ask Demands* – specific mental, physical, or team requirements necessary to accomplish a particular task successfully, e.g., workload, time pressure, roles and responsibilities, and standards.

W **W***ork Environment* – general influences of the workplace, organizational, and cultural conditions that affect individual behavior, e.g., distractions, equipment layout, lighting, temperature, tagout procedures, shared norms and values, attitude toward various hazards, and work control processes.

I ***I****ndividual Capabilities* – unique mental, physical, and emotional abilities of a particular person assigned a specific task, (e.g., familiarity with task, values, education, knowledge, skills, attitudes, personality, experience, health and fitness, age, communication practices, and self-esteem).

N *Human* ***N****ature* – generic traits or dispositions of being human that may incline individuals to err under certain unfavorable conditions, (e.g., habit, short-term memory, fatigue, stress, complacency, and mental shortcuts)

Task Demands:	**Individual Capabilities:**
High workloads (memory requirements)	Unfamiliarity with task/first time
Time pressure (in a hurry)	Lack of knowledge
Simultaneous, multiple tasks	New technique not used before
Repetitive actions/Monotony	Imprecise communication habits
Irrecoverable actions	Lack of proficiency/inexperience
Interpretation requirements	Unsystematic problem-solving skills
Unclear goals, roles, or responsibilities	“Can-do” attitude for crucial task
Lack of or unclear standards	Illness or fatigue
Work Environment:	**Human Nature:**
Distractions/interruptions	Stress
Changes/departure from routine	Habit patterns
Confusing procedure/vague guidance	Assumptions
Confusing displays/controls	Complacency/overconfidence
Workarounds/inadequate or improper tools	Mind set (intention)
	Inaccurate risk perception/understanding
Unexpected response	Mental shortcuts (biases)
Unexpected equipment conditions	Limited short-term memory
Poor working conditions	

ATTACHMENT 5 continued
Error Precursors and Recommended Actions

Task Demands	Recommended Tools/Actions
High Workload, Simultaneous or Multiple Tasks	Match task with worker Pre-Job Briefing Emphasize critical steps Take periodic breaks Break task into smaller tasks Provide sufficient personnel Procedure Use and Adherence Identify relief personnel
Time Pressure	Match task to worker Pre-Job Briefing Remove all distractions S.T.A.R. Supervisor Hold Points
Repetitive Actions	Take periodic breaks Peer Check Utilize Supervisor Hold Points
Irreversible Actions	Task Preview / PJB (Discuss mitigating actions) S.T.A.R. Peer Check / Concurrent Verification Verbalize Procedure Use & Adherence
Unclear goals, roles, responsibilities, or standards	Pre-Job Briefing Time Out Seek clarification before proceeding with task

ATTACHMENT 5 continued
Error Precursors and Recommended Actions

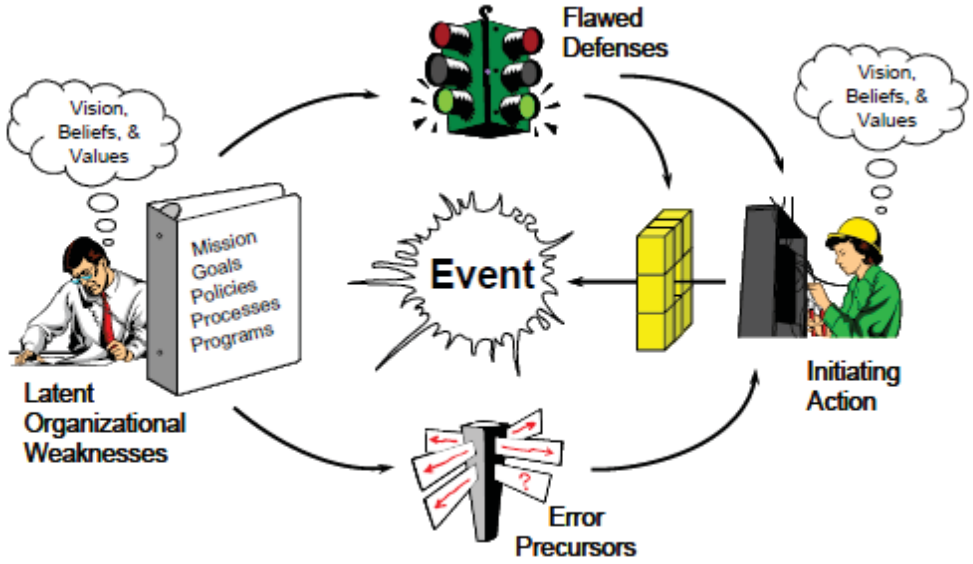
Work Environment	Recommended Tools/Actions
Distractions / Interruptions	S.T.A.R. Peer Check Eliminate distractions Placekeeping Review previous steps to ensure nothing was missed.
Confusing procedure Vague Guidance	Time Out Challenge the procedure Seek clarification before proceeding with task
Unexpected Equipment Response	Time Out Avoid rationalizing Pre-Job Briefing Discuss potential equipment responses & expected actions taken by performer.
Delays, idle time	S.T.A.R. Procedure Use & Adherence Placekeeping Review previous steps before continuing to ensure none are being skipped or missed.
Departure from routine	Task Preview / PJB (Discuss changes) S.T.A.R. Peer Check Procedure Use and Adherence Maintain a Questioning Attitude
Confusing Displays/Controls	Time Out Avoid rationalizing Seek clarification before proceeding with task S.T.A.R. Peer Check
Workarounds/ Inadequate or Improper Tools	Time Out Procedure Use and Adherence

Individual Capabilities	Recommended Tools/Actions
First Time Performer Unfamiliar with Task Inexperience	Job Observation Peer Check S.T.A.R. Questioning Attitude Procedure Use & Adherence OMM / Situational Awareness 3-Part Communication Time Out JIT Training Supervisor Hold Points
New Technique Departure from Routine	Task Preview / PJB (Discuss changes) Procedure Use & Adherence S.T.A.R. Peer Check Maintain a Questioning Attitude
Drop your Guard (Worker trusts his partner to do job correctly.)	Peer Check Challenge others Questioning Attitude Job Observation
Illness or fatigue	Match task and worker Break tasks into smaller tasks Pre-Job Brief (discuss individual capabilities) Take periodic breaks
“Can-do” attitude for crucial task	Task Preview / PJB (Discuss critical steps) Procedure Use and Adherence S.T.A.R. Questioning Attitude Job Observation

ATTACHMENT 5 continued
Error Precursors and Recommended Actions

Human **N**ature	Recommended Tools/Actions
Condition of Workers (Fatigue, sick, stress)	Match task to worker PJB (discuss conditions of workers) Break task into smaller tasks Take periodic breaks If possible, avoid starting task after meals, breaks, or at the end of shift.
Assumptions	Peer Check Time Out Avoid rationalizing Validate assumptions with facts before proceeding with task.
Complacency or Overconfidence	Job Observation Peer Check Questioning Attitude S.T.A.R.
Tunnel Vision (Lack of big picture) Inaccurate Risk Perception	Task Preview / PJB OMM/Situational Awareness

Attachment 6 - Anatomy of an Event



ANATOMY OF AN EVENT - An event is an unwanted, undesirable change

Events are caused. Typically, they are triggered by human action. In most cases, the human action causing the event was in error. However, the action could have been directed by a procedure; or it could have been a shortcut to get the job done. The cycle can be broken, but only by understanding how events come about through human error. The *Anatomy of an Event* provides a picture (see illustration) of the elements that exist before an event occurs. Breaking the links will prevent events.

Initiating Action - An initiating action is an action by an individual, whether correct, in error, or in Violation.

Active errors - Errors that have immediate, observable, undesirable outcomes.

Flawed Defenses - Defects, under the right circumstances, may inhibit the ability of defensive measures to protect plant equipment or people against hazards or fail to prevent the occurrence of active errors.

Error Precursors - Error precursors are unfavorable conditions at the job site that increase the probability for error at the moment of a specific action, that is, error-likely situations.

Latent Organizational Weaknesses - Hidden conditions in management control processes.