



NERC CCAP Cause Code Quick Reference

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		I						
	A1 Design/Engineering	A2 Equipment/Material	A3 Individual Human Performance	A4 Management / Organization	A5 Communication	A6 Training	A7 Other	A8 (Open)
	B1 DESIGN INPUT LTA	B1 CALIBRATION FOR INSTRUMENTS LTA	B1 SKILL BASED ERROR	B1 MANAGEMENT METHODS LTA	B1 WRITTEN COMMUNICATIONS METHOD OF	B1 NO TRAINING PROVIDED	B1 EXTERNAL PHENOMENA	
	B2 DESIGN OUTPUT LTA	B2 PERIODIC/ CORRECTIVE MAINTENANCE LTA	B2 RULE BASED ERROR	B2 RESOURCE MANAGEMENT LTA	PRESENTATION LTA B2 WRITTEN	B2 TRAINING METHODS LTA	B2 RADIOLOGICAL/ HAZARDOUS MATERIAL PROBLEM	AX Overall Configuration
	B3 DESIGN/	B3 INSPECTION/	B3 KNOWLEDGE	B3 WORK ORGANIZATION &	COMMUNICATION CONTENT LTA	B3 TRAINING MATERIAL LTA	B3 VENDOR OR SUPPLIER PROBLEM	B1 INSTALLATION/DESIGN CONFIGURATION LTA
DOCUMENTATION LTA	TESTING LTA	BASED ERROR	PLANNING LTA	B3 WRITTEN COMMUNICATION NOT			B2 MAINTENANCE/MODIFICATION	
	B4 DESIGN/ INSTALLATION VERIFICATION LTA	B4 MATERIAL CONTROL LTA	B4 WORK PRACTICES LTA	B4 SUPERVISORY METHODS LTA	USED			CONFIGURATION LTA
	B5 OPERABILITY OF DESIGN/ENVIRONMENT	B5 PROCUREMENT CONTROL LTA		B5 CHANGE MANAGEMENT LTA	B4 VERBAL COMMUNICATION LTA			

AZ - Information to determine cause LTA

B1 UNABLE TO IDENTIFY SPECIFIC ROOT CAUSE

B2 REPORT STOPS AT FAILURE/ERROR MODE (WHAT HAPPENED, NOT WHY IT HAPPENED)

B3 OTHER PARTIES INVOLVED IN EVENT

B4 CROSS-REFERENCE REQUIRED FOR OTHER SOURCES OF INFORMATION

NERC REGIONS

Disclaimer: This NERC Event Analysis document is a working document used for analyzing events in order to identify reliability risk to the North American Bulk Power System, to ensure and continuously improve reliability. This document cannot be used for compliance monitoring or enforcement purposes. Any statements or conclusions on this document will not prejudge the outcome of an event analysis or a potential compliance review associated with the same facts or circumstances. This document makes no findings regarding compliance with Reliability Standards.

AN - No causes found

Level A nodes are underlined Level B nodes are in ALL CAPS

Level C nodes are in "sentence case" LTA = Less Than Adequate

B6 DEFECTIVE. FAILED, OR CONTAMINATED

B7 EQUIPMENT

INTERACTIONS LTA





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A1 Design/Engineering

B1 DESIGN INPUT LTA

- C01 Design input cannot be met
- C02 Design Input obsolete
- C03 Design input not correct

C04 Necessary design input not available

B2 DESIGN OUTPUT LTA

- C01 Design output scope LTA C02 Design output not clear
- CB3 Design output not correct
- C84 Inconsistent design output
- COS Design input not addressed in design output
- C06 Drawing, specification, or data error C07 Error in equipment or material selection
- CD8 Errors not detectable

B3 DESIGN/DOCUMENTATION LTA

- C01 Design / documentation not complete
- C02 Design /documentation not up-to-date

C03 Design/documentation not controlled B4 DESIGN/INSTALLATION

- VERIFICATION LTA C01 Independent review of design / documentation LTA
- C02 Testing of design / Installation LTA
- C03 Independent Inspection of design / Installation LTA C04 Acceptance of design / Installation LTA

B5 OPERABILITY OF DESIGN/ ENVIRONMENT LTA

- C01 Ergonomics LTA
- C02 Physical environment LTA

AN – No causes found

AZ – Information to determine cause LTA –

B1 UNABLE TO IDENTIFY SPECIFIC ROOT CAUSE

- CO1 Multiple, parallel causal sequences exist
- CO2 Context out-of-scope of analysis C03 No cause uncovered after exhaustive testing

B2 REPORT STOPS AT FAILURE/ERROR MODE

- C01 Apparent Cause Analysis only
- C02 No causal sequence established or identified
- C03 Attributed to weather beyond initiating cause

B3 OTHER PARTIES INVOLVED IN EVENT

- C01 Other entity cited as involved in event
- C02 Vendor or contractor cited as involved in event

B4 CROSS-REFERENCE REQUIRED FOR OTHER SOURCES OF INFORMATION

CD1 Requires secondary review once appropriate reports are received C02 Requires secondary review once additional outside investigative

A2 Equipment/Material

B1 CALIBRATION FOR INSTRUMENTS LTA

- C01 Calibration LTA
- CD2 Equipment found outside acceptance
- C03 Coordinated tuning or adjustment of

B2 PERIODIC/ CORRECTIVE MAINTENANCE LTA

- C01 Preventive maintenance for equipment
- C02 Predictive maintenance LTA
- C03 Corrective maintenance LTA C04 Equipment history LTA

B3 INSPECTION/ TESTING

- LTA C01 Start-up testing LTA
- C02 Inspection / testing LTA C03 Post-maintenance / Post-modification

B4 MATERIAL CONTROL LTA

- CR1 Material bandling LTA
- C02 Material storage LTA
- C03 Material packaging LTA
- C04 Material shipping LTA
- C05 Shelf life exceeded C06 Unauthorized material substitution
- C07 Marking / labeling LTA

B5 PROCUREMENT CONTROL LTA

- CB1 Control of changes to procurement specification / purchase order LTA
- C02 Fabricated Item did not meet requirements.
- CO3 Incorrect Item received

B6 DEFECTIVE, FAILED, OR CONTAMINATED

C01 Damaged, defective or falled part C02 Defective or falled material

C04 Product acceptance requirements LTA

- C03 Defective weld, braze, solder joint, crimp, hinge, or other connection
- CR4 End-of-life failure CD5 Electrical or instrument noise

C07 Software failure

- B7 EQUIPMENT INTERACTIONS LTA
- C01 Communications path LTA
- C02 Data quality LTA
- CD3 Supporting power system LTA C04 Undesirable operation of Coordinated

A3 Individual Human Performance

B1 SKILL BASED ERROR

- CB1 Check of work LTA
- C02 Step was omitted due to distraction C03 incorrect performance due to mental
- C04 Infrequently performed steps were performed incorrectly
- CD5 Delay in time caused LTA actions CD6 Wrong action selected based on
- similarity with other actions C07 Omission / repeating of steps due to assumptions for completion

B2 RULE BASED ERROR

- C01 Strong rule incorrectly chosen over other rules
- C02 Signs to stop were ignored and steps
- C03 Too much activity was occurring and error made in problem solving CD4 Previous success in use of rule reinforced continued use of rule
- represented resulting in wrong rule used
- B3 KNOWLEDGE BASED FRROR
- C01 Attention was given to wrong issues C02 LTA conclusion based on sequencing of facts
- C03 Individual justified action by focusing on blased evidence C04 LTA review based on assumption that
- process will not change COS Incorrect assumption that a correlation existed between two or more facts C06 Individual underestimated the problem by using past events as basis

B4 WORK PRACTICES LTA

C01 individual's capability to perform work LTA [Examples include: Sensory /perceptual capabilities LTA: Motor / physical capabilities LTA; and Attitude / psychological profile LTA] C02 Deliberate violation

A4 Management / Organization

B1 MANAGEMENT METHODS LTA

- C01 Management policy guidance or expectations are not well-defined, understood, or enforced C02 Job performance standards not adequately
- defined C03 Management direction created insufficient awareness of impact of actions on safety / reliability C04 Management follow-up or monitoring of activities
- did not identify problems C05 Management assessment did not determine causes of previous event or known problem C06 Previous industry or in-house experience was
- not effectively used to prevent recurrence C07 Responsibility of personnel not well-defined or personnel not held accountable CDS Corrective action responses to a known or
- repetitive problem was untimely C09 Corrective action for previously identified problem or event was not adequate to prevent

B2 RESOURCE MANAGEMENT LTA

- C01 Too many administrative duties assigned to
- Immediate supervisor
 C02 Insufficient supervisory resources to provide
- C03 insufficient manpower to support identified goal/
- C04 Resources not provided to assure adequate training was provided / maintained C05 Needed resource changes not approved /
- funded C06 Means not provided to assure procedures / documents / records were of adequate quality and
- up-to-date C07 Means not provided for assuring adequate availability of appropriate materials / tools COS Means not provided for assuring adequate equipment quality, reliability, or operability C09 Personnel selection did not assure match of worker motivations and job descriptions

C10 Means/method not provided for assuring

B3 WORK ORGANIZATION & PLANNING LTA

- CD1 insufficient time for worker to prepare task
- C02 insufficient time allotted for task
- C03 Duties not well-distributed among personnel
- C04 Too few workers assigned to task COS insufficient number of trained or experienced workers assigned to task
- C06 Planning not coordinated with inputs from Walk downs/Task analysis C07 Job scoping did not identify potential task
- Interruptions &/or environmental stress CDB Job scoping did not identify special circumstances
- C09 Work planning not coordinated with all departments
- C10 Problem performing repetitive tasks &/or sub-tasks C11 Inadequate work package preparation

B4 SUPERVISORY METHODS LTA

- C01 Tasks and individual accountability not made clear to
- C02 Progress / status of task not adequately tracked C03 Appropriate level of in-task supervision not determined
- C04 Direct supervisory involvement in task interfered with overview role CD5 Emphasis on schedule exceeded emphasis on
- methods / doing a good job C06 Job performance and self-checking standards not properly communicated
- C07 Too many concurrent tasks assigned to worker
- CDB Frequent job or task "shuffling" CD9 Assignment did not consider worker's need to use higher-order skills
- C10 Assignment did not consider worker's previous task C11 Assignment did not consider worker's ingrained work patterns
- C12 Contact with personnel too infrequent to detect work habit / attitude changes C13 Provided feedback on negative performance but not on

B5 CHANGE MANAGEMENT LTA

positive performance

- C01 Problem identification did not identify need for change
- C02 Change not implemented in timely manner
- C03 Inadequate vendor support of change C04 Risks / consequences associated with change not adequately reviewed / assessed
- COS System Interactions not considered or identified C06 Personnel / department interactions not
- C07 Effects of change on schedules not adequately
- addressed C08 Change-related training / retraining not performed or not adequate
- C09 Change-related documents not developed or C10 Change-related equipment not provided or not
- C11 Changes not adequately communicated C12 Change not identifiable during task C13 Accuracy / effectiveness of change not verified

A5 Communication

B1 WRITTEN COMMUNICATIONS METHOD OF

- PRESENTATION LTA C01 Format deficiencies
- CD3 Checklist LTA C04 Deficiencies in user aids (charts,
- C05 Recent changes not made apparent
- CD6 Instruction step / Information in wrong sequence C07 Unclear / complex wording or

B2 WRITTEN COMMUNICATION CONTENT LTA

- C01 Limit inaccuracies C02 Difficult to implement
- C03 Data / computations wrong / Incomplete
- C04 Equipment Identification LTA C05 Ambiguous Instructions / requirements
- COS Typographical error C07 Facts wrong / requirements
- COS incomplete / situation not covered C09 Wrong revision used

B3 WRITTEN COMMUNICATION NOT USED

- C01 Lack of written C02 Not available or inconvenient

B4 VERBAL COMMUNICATION LTA

- C01 Communication between work groups LTA C02 Shift communications LTA C03 Correct terminology not used C04 Verification / repeat back not used
- C05 Information sent but not understood C06 Suspected problems not communicated to supervision C07 No communication method avallable

A6 Training

B1 NO TRAINING PROVIDED

- C01 Decision not to train
- C02 Training requirements not identified
- C03 Work incorrectly considered "skill of the craft"

B2 TRAINING METHODS LTA

- C01 Practice or hands-on experience LTA
- C02 Testing LTA C03 Refresher training LTA

C04 Inadequate presentation

- B3 TRAINING MATERIAL LTA C01 Training objectives LTA
- C02 Inadequate content
- C03 Training on new work methods LTA CR4 Performance standards LTA

A7 Other

B1 EXTERNAL PHENOMENA

- C01 Weather or ambient conditions LTA
- C02 Power failure or transient C03 External fire or explosion
- C04 Other natural phenomena LTA COS Copper Theft

B2 RADIOLOGICAL/HAZARDOUS MATERIAL PROBLEM

C01 Legacy contamination C02 Source unknown

B3 VENDOR OR SUPPLIER

- PROBLEM C01 Follow-up LTA
- C02 Vendor corrective actions LTA C03 Extent-of-Condition communications

A8 (Open)

AX Overall Configuration

B1 INSTALLATION/DESIGN CONFIGURATION LTA

B2 MAINTENANCE/MODIFICATION CONFIGURATION LTA

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