

Causal Analysis Tree Rev. 0

START
HERE

A1 Design/ Engineering Problem

- 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
C03 Design output not correct
C04 Inconsistent design output
C05 Design input not addressed in design output
C06 Drawing, specification, or data error
C07 Error in equipment or material selection
C08 Errors not detectable
C09 Errors not recoverable

- 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
C03 Natural environment LTA

A2 Equipment/ Material Problem

- B1 CALIBRATION FOR INSTRUMENTS LTA**
C01 Calibration LTA
C02 Equipment found outside acceptance criteria
- B2 PERIODIC/
CORRECTIVE
MAINTENANCE LTA**
C01 Preventive maintenance for equipment LTA
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 testing LTA

- B4 MATERIAL
CONTROL LTA**
C01 Material handling 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**
C01 Control of changes to procurement specifications/
purchase order LTA
C02 Fabricated item did not meet requirements
C03 Incorrect item received
C04 Product acceptance requirements LTA

- B6 DEFECTIVE,
FAILED OR
CONTAMINATED**
C01 Defective or failed part
C02 Defective or failed material
C03 Defective weld, braze or soldering joint
C04 End of life failure
C05. Electrical or instrument noise
C06 Contaminant

A3 Human Performance LTA

- B1 SKILL BASED ERROR**
C01 Check of work was LTA
C02 Step was omitted due to distraction
C03 Incorrect performance due to mental lapse
C04 Infrequently performed steps are performed incorrectly
C05 Delay in time cause LTA actions
C06 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 are ignored and step performed incorrectly
C03 Too much activity is occurring and error made in problem solving
C04 Previous success in use of rule reinforces continued use of rule
C05 Situation incorrectly identified or represented resulting in wrong rule used

- B3 KNOWLEDGE BASED
ERROR**
C01 Attention was given to wrong issues
C02 LTA conclusion based on sequencing of facts
C03 Individual justified action by focusing on biased evidence
C04 LTA review based on assumption that process will not change
C05 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 Problem

- B1 MANAGEMENT
METHODS LTA**
C01 Management policy guidance/ expectations 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
C08 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 recurrence

- B2 RESOURCE
MANAGEMENT LTA**
C01 Too many administrative duties assigned to immediate supervisor
C02 Insufficient supervisory resources to provide necessary supervision
C03 Insufficient manpower to support identified goal/objective
C04 Resources not provided to assure adequate training is 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
C08 Means not provided for assuring adequate equipment quality, reliability, or operability
C09 Personnel selection did not assure match of worker motivations/job descriptions
C10 Means/method not provided for assuring adequate quality of contract services

- B3 WORK ORGANIZATION & PLANNING LTA**
C01 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
C05 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 and/or environmental stress
C08 Job scoping did not identify special circumstances and/or conditions
C09 Work planning not coordinated with all departments involved in task
C10 Problem performing repetitive tasks and/or subtasks
C11 Inadequate work package preparation

- B4 SUPERVISORY METHODS LTA**
C01 Tasks and individual accountability not made clear to worker
C02 Progress/status of task not adequately tracked
C03 Appropriate level of in-task supervision not determined prior to task
C04 Direct supervisory involvement in task interfered with overview role
C05 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
C08 Frequent job or task "shuffling"
C09 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 positive performance

- B5 CHANGE MANAGEMENT LTA**
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
C05 System interactions not considered
C06 Personnel/department interactions not considered
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 revised
C10 Change related equipment not provided or not revised
C11 Changes not adequately communicated
C12 Change not identifiable during task
C13 Accuracy/effectiveness of change not verified or not validated

A5 Communications LTA

- B1 WRITTEN
COMMUNICATIONS
METHOD OF
PRESENTATION LTA**
C01 Format deficiencies
C02 Improper referencing or branching
C03 Checklist LTA
C04 Deficiencies in user aids (charts, etc.)
C05 Recent changes not made apparent to user
C06 Instruction step/ information in wrong sequence
C07 Unclear/complex wording or grammar

- 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
C06 Typographical error
C07 Facts wrong/ requirements not correct
C08 Incomplete/situation not covered
C09 Wrong revision used

- B3 WRITTEN
COMMUNICATION
NOT USED**
C01 Lack of written communication
C02 Not available or inconvenient for use

- 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 available

A6 Training Deficiency

- 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
C04 Performance standards LTA

A7 Other Problem

- B1 EXTERNAL PHENOMENA**
C01 Weather or ambient conditions LTA
C02 Power failure or transient
C03 External fire or explosion
C04 Other natural phenomena LTA

- B2 RADIOLOGICAL/HAZARDOUS
MATERIAL PROBLEM**
C01 Legacy contamination
C02 Source unknown

Level A nodes are underlined.
Level B nodes are in ALLCAPS.
Level C nodes are in "sentence case."
LTA = Less than adequate