# Causal Analysis Tree Rev. 1



A4 Management Problem

B1 MANAGEMENT METHODS

C01 Management policy guidance/

expectations not well-defined,

C02 Job performance standards not

C03 Management direction created

insufficient awareness of impact

of actions on safety/ reliability

monitoring of activities did not

C05 Management assessment did not

determine causes of previous

C06 Previous industry or in-house

experience was not effectively

C07 Responsibility of personnel not

well-defined or personnel not held

C08 Corrective action responses to a

known or repetitive problem was

previously identified problem or

B2 RESOURCE MANAGEMENT

C02 Insufficient supervisory

C03 Insufficient manpower to

C04 Resources not provided to

provided / maintained

adequate availability of

appropriate materials / tools

adequate equipment quality,

C09 Personnel selections did not

motivations / job descriptions

C10 Means / method not provided

for assuring adequate quality of contract services

reliability, or operability

assure match of worker

C08 Means not provided for assuring

approved / funded

to-date

assure adequate training was

C05 Needed resource changes not

C06 Means not provided for assure

procedures/ documents/ records

were of adequate quality and up-

C01 Too many administrative duties

resources to provide necessary

support identified goal/ objective

assigned to immediate supervisor

event was not adequate to prevent

event or known problem

used to prevent recurrence

C09 Corrective actions for

C04 Management follow-up or

understood or enforced

adequately defined

identify problems

accountable

recurrence

supervision

LTA

## 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
- C08 Error not detectable
- C09 Errors not recoverable

#### B3 DESIGN/ DOCUMENTATION LTA

- C01 Design/ documentation not complete LTA
- C02 Design/ documentation not
- C03 Design/documentation not controlled

#### B4 DESIGN/INSTALLATION VERIFICATION LTA

- C01 Independent review of design/documentation LTA
- C02 Testing of design/installation
- 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
- 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 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 point
- C04 End of life failure
- C05 Electrical or instrument C06 Contamination

## A3 Human Performance LTA

## B1 SKILL BASED ERROR

- C01 Check of work was LTA C02 Step was omitted due to
- mental lapse C03 Incorrect performance due to mental lapse
- C04 Infrequently performed steps were performed incorrectly
- C05 Delay in time caused LTA actions C06 Wrong action selected based
- on similarity with other actions C07 Omission / repeating of steps due to assumptions for

#### B2 RIILE BASED ERROR

completion

- C01 Strong rule incorrectly chosen over other rules C02 Signs to stop were ignored
- and step performed incorrectly C03 Too much activity was occurring and error made in
- problem solving C04 Previous success in use of rule reinforced 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
- 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 event 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
- C02 Deliberate violation

## 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
- 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 higherorder skills
- C10 Assignment did not consider worker's previous task
- C11 Assignment did not consider worker's ingrained work
- 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 a timely manner
- C03 Inadequate vendor support of change
- C07 Means not provided for assuring 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
  - C09 Change-related documents not developed or revised
  - C10 Change-related equipment not developed or revised
  - C11 Changes not adequately communicated
  - C12 Change not identifiable during task C13 Accuracy/ effectiveness of change not verified or not validated

# A5 Communication LTA METHODS OF PRESENTATION

# B1 WRITTEN COMMUNICATIONS

- C01 Format deficiencies
- C02 Improper referencing or branching
- C03 Checklist LTA
- C04 Deficiencies in user aids (charts.
- 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 to

#### 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
- 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
- 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

B3 LEGACY C01 Legacy issues that are not related

### to radiological or hazardous material B4 NO CAUSE IS APPLICABLE

C01 No cause is known for this event

USED ONLY FOR ORPS CODING

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

LTA - Less than adequate

"Sentence case."

Attachment