Root Cause Chart™

Start here with each causal factor

Top-level categories:
- Equipment Difficulty [5]
- Personnel Difficulty [5]
- Natural Phenomena [5]
- Sabotage/Horseplay [6]
- Other Difficulty [6]

Equipment Difficulty [5] branches:

Design Input/Output [7]

- **Design Input NI** [11]
  - Design Input Cannot Be Met [12]
  - Design Input Obsolete [12]
  - Design Input Not Correct [12]
  - Necessary Design Input Not Available [12]
- **Design Output NI** [11]
  - Scope [13]
  - Design Output Not Clear [13]
  - Design Output Not Correct [13]
  - Inconsistent Design Output [13]
  - Design Input Not Addressed in Design Output [13]

Equipment Reliability Program [7]

- **Overall Program NI** [14]
  - No Program [15]
  - Procedure for Determining Needs for Equipment NI [15]
  - Risk Acceptance Criteria NI [15]
  - Allocation of Resources NI [15]
- **Equipment/Reliability Records NI** [14]
  - Equipment Design Records NI [16]
  - Equipment Operating/Reliability History NI [16]
- **Reliability Program Implementation NI** [14]
  - Equipment Missing from Reliability System [17]
  - Selection of Type of Task NI [17]
  - Task Frequency/Trigger Identification or Adjustment NI [17]
  - Task Initiation NI [18]
  - Tracking/Closure of Task NI [18]
- **Reliability Task Execution NI** [14]
  - Reactive/Corrective Maintenance NI [19]
  - Preventive Maintenance NI [19]
  - Predictive Maintenance NI [19]
  - Proactive Maintenance NI [19]
  - Failure Finding Maintenance NI [20]
  - Routine Equipment Rounds NI [20]

Administrative/Management Systems [7]

- **Standards, Policies, or Administrative Controls (SPACs) NI** [22]
  - No SPACs [24]
  - Not Strict Enough [24]
  - Confusing or Incomplete [24]
  - Technical Error [24]
  - Responsibility for Item/Activity Not Adequately Defined [25]
  - Contradictory Requirements [25]
  - Scheduling/Tracking System NI [25]
  - Employee Screening/Selection NI [25]
- **Standards, Policies, or Administrative Controls (SPACs) Not Used** [22]
  - Communication of SPACs NI [26]
  - Recently Changed [26]
  - Enforcement NI [26]
  - Difficult to Implement [26]
- **Safety/Hazard/Risk Review NI** [22]
  - Risk Review NI [27]
  - Not Performed [27]
  - Recommendations Not Yet Implemented [27]
  - Risk Acceptance Criteria NI [27]
  - Review Procedure or Leader Training NI [27]
- **Problem Identification, Investigation, and Control NI** [22]
  - Problem Reporting NI [28]
  - Problem Investigation/Analysis NI [28]
  - Corrective Action NI [28]
  - Corrective Action Not Yet Implemented [28]
- **Product/Material Control NI** [22]
  - Handling NI [29]
  - Storage NI [29]
  - Packaging NI [29]
  - Shipping NI [29]
  - Shelf Life Exceeded [29]
  - Unauthorized Product/Material Substitution [30]
  - Product/Material Inspections NI [30]
- **Procurement Control NI** [23]
  - Product Acceptance Requirements Do Not Match Design Requirements [30]
  - Control of Changes to Procurement Specifications/Purchase Orders NI [31]
  - Fabricated Item Does Not Meet Specs [31]
  - Incorrect Item Received [31]
  - Product/Service Accept. Req. NI [31]
- **Document and Configuration Control NI** [23]
  - Change Not Identified or Reviewed [32]
  - Control (and verification) of Design/Field Changes NI (No PSSR) [32]
  - Documentation Not Up-to-Date [32]
  - Control of Documents NI [32]

Procedures [8]

- **Procedure Not Used** [33]
  - Not Available or Inconvenient to Obtain [34]
  - Procedure Difficult to Use [34]
  - Use Not Required but Should Be [34]
  - No Procedure for Task [34]
- **Misleading/Confusing** [33]
  - Format Confusing or NI [35]
  - More Than One Action per Step [35]
  - No Checkoff Space Provided but Should Be [35]
  - Inadequate Checklist [35]
  - Graphics NI [35]
  - Ambiguous or Confusing Instructions/Requirements [36]
  - Data/Computations Wrong/Incomplete [36]
  - Equipment Identification NI [36]
  - Excessive References [36]
  - Multiple Area References [36]
  - Identification of Revised Steps NI [37]
  - Presentation of Limits NI [37]
- **Wrong/Incomplete** [33]
  - Typographical Error [38]
  - Sequence Wrong [38]
  - Facts Wrong/Requirements Not Correct [38]
  - Wrong Revision Used [38]
  - Inconsistency Between Requirements [38]
  - Incomplete/Situation Not Covered [38]

Personnel Difficulty [5] branches:

Human Factors Engineering [8]

- **Workplace Layout NI** [39]
  - Controls NI [40]
  - Displays NI [40]
  - Control/Display Integration NI [40]
  - Conflicting Layouts [41]
  - Reach or Visual Envelope NI [41]
  - Labeling NI [41]
- **Work Environment NI** [39]
  - Housekeeping NI [42]
  - Climate NI [42]
  - Lighting NI [42]
  - Excessive Noise [42]
  - PPE NI [43]
  - Other Environmental Stressors NI [43]
- **Workload NI** [39]
  - Knowledge-based Decision Required [44]
  - Excessive Control Action Required [44]
  - Unrealistic Monitoring Required [45]
  - Excessive Mental Math, Memory, Logic Required [45]
- **Intolerant System** [39]
  - Errors Not Detectable [46]
  - Errors Not Recoverable [46]

Training [8]

- **No Training** [47]
  - Decision Not to Train [48]
  - Training Requirements Not Identified [48]
- **Training Records System NI** [47]
  - Training Records Incorrect [49]
  - Training Records Not Up-to-Date [49]
- **Training NI** [47]
  - Job/Task Analysis NI [50]
  - Program Design NI [50]
  - Training Objectives NI [50]
  - Lesson Content NI [50]
  - On-the-Job Training NI [50]
  - Qualification Testing NI [50]
  - Continuing Training NI [51]
  - Training Support Equipment NI [51]
  - Instructor Qualifications NI [51]
  - Training on New Work Methods NI [51]
  - Abnormal Events/Emergency Training NI [51]
  - Qualifications Standard NI [51]

Immediate Supervision [8]

- **Preparation NI** [52]
  - No Preparation [53]
  - Job Plan NI [53]
  - Instructions to Workers NI [53]
  - Walkthrough NI [53]
  - Scheduling NI [54]
  - Worker Selection/Assignment NI [54]
- **Supervision During Work NI** [52]
  - No Supervision [55]
  - Supervision NI [55]

Communication [9]

- **No Communication or Not Timely** [56]
  - Method Not Available or NI [57]
  - Communication Between Work Groups NI [57]
  - Communication Between Shift Workers and Management NI [57]
  - Communication with Contractors NI [57]
  - Communication with Customers NI [57]
- **Misunderstood Communication** [56]
  - Standard Terminology Not Used [58]
  - Verification/Repeat-back Not Used [58]
  - Long Message [58]
  - Speech Interference [58]
- **Work/Shift Turnover NI** [56]
  - Communication Within Shifts NI [59]
  - Communication Between Shifts NI [59]

Fitness for Duty [9]

- **Sensory/Perceptual Capabilities NI** [60]
- **Personal Stress ID/management system NI** [60]
- **Motor/Physical Capabilities NI** [60]
- **Substance Abuse Issue** [61]
- **Rest/Sleep NI (Fatigue)** [61]
- **Illness/Medication Problems** [61]

Legend

Shape	Description
(rectangle)	Causal Factor Type
(chevron)	Root Cause Category
Bold	Near Root Cause
(hexagon)	Root Cause

Note: Node numbers correspond to the matching page numbers in PII's *Root Cause Coding Guide*. There are typically more than one node per page

Note: NI = Needs Improvement