

# Maintenance QC LOSA Audit – Threat Codes

## Instructions for Use:

1. The following categories provide a number for the “Threat Code” column in the Maintenance QC LOSA Observation Form.
2. Select a letter and number combination (e.g., Qc/D1= Too much or little lighting or glare)
3. More than 1 code per item is possible

## Definitions:

**Threat** -- any condition that increases complexity of the operations and if not managed properly can decrease the safety margin.

**Error** – a mistake that is made when threats are mismanaged.

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### **Qc/A. Task Factors**

- Qc/A 1. Large size or area of the object (longer search time needed, lower the probability of detection)
- Qc/A 2. High background complexity
- Qc/A 3. Greater number of target types (longer search time needed, lower the probability of detection)
- Qc/A 4. Low target/background contrast (including luminance, color, shape contrast, presence of unique features on either target or background components, target orientation and superposition)
- Qc/A 5. Smaller target size
- Qc/A 6. Low probability of a target existence
- Qc/A 7. Time pressure and/or externally-paced tasks
- Qc/A 8. Absence of position markers
- Qc/A 9. Rare events (e.g., rare defects that even experienced inspectors have not seen in their work lifetime.)
- Qc/A 10. Difficult detection tasks
- Qc/A 11. High repetitive tasks
- Qc/A 12. Low signal strength
- Qc/A 13. Prototypical defects are not presented as part of the task (e.g., stored in the inspector's memory)
- Qc/A 14. Workcards are poorly integrated into the inspection task
- Qc/A 15. Multiple targets on different components
- Qc/A 16. Other (explain below)

### **Qc/B. Operator Factors**

- Qc/B 1. Less experience and/or younger in age when age is an indicator of experience.
- Qc/B 2. Cognitive ability in dis-embeding objects from complex and confusion backgrounds.
- Qc/B 3. Poor foveal visual acuity
- Qc/B 4. Beyond 5-30 degrees of eccentricity, i.e., distance from the optic axis to the target
- Qc/B 5. Small Useful Field of View (UFOV), or Visual Lobe
- Qc/B 6. Catell 16 Personality Factor scale, e.g., Stability, Enthusiasm, Sensitivity and Suspicion, Introversion/Extraversion
- Qc/B 7. Other (explain below)

### **Qc/C. Machine Factors**

- Qc/C 1. Less sufficient magnification
- Qc/C 2. Lack of field integration with a perfect item (e.g., don't utilize temporal or spatial fusion)
- Qc/C 3. Lack of visual enhancement (e.g., edge sharpening, false coloring or even monochrome rendering)
- Qc/C 4. Inspection done by unaided humans or automated algorithms
- Qc/C 5. Other (explain below)

### **Qc/D. Environmental Factors**

- Qc/D 1. Too much or little lighting or glare
- Qc/D 2. Noisy environment (above 90 dB) (e.g., some noise is found to improve vigilance performance in lab).
- Qc/D 3. Too cold or hot
- Qc/D 4. Discomfort physical design of the workplace (e.g., positioning, design of chair, keyboard, screen and footrest)
- Qc/D 5. Other (explain below)

**Qc/E. Social Factors**

T/E 1. Extended working period

T/E 2. Influence of supervision, instructions, and other pressure

T/E 3. Lack of performance feedback

T/E 4. Inconsistent job aids

T/E 5. Social isolation (e.g., social interaction and even some forms of distraction are found to improve vigilance performance in lab).

T/E 6. Cumulative fatigue from shift working

T/E 7. Late night shift

T/E 8. Other (explain below)

**Qc-F. Other Contributing Factors (explain below)**