Guidance Sheet SMP04/G/01 – Hazard Checklists

This guidance contains information which can be used to generate Hazard Checklists for use in the conduct of PHI&A to identify possible Hazards and Accidents which might be associated with a system. Any Hazard checklist must be used in a "brainstorming", imaginative way to stimulate discussions between stakeholders who have a good understanding of the system, its context and usage/maintenance environment. Checklists application in a narrow way or by those with a vague appreciation of the system will be very much less effective.

General Hazard Checklist

B.1 The following headings provide a basis for the compilation of checklists to assist Preliminary Hazard Listing and Preliminary Hazard Analysis. The contents of the annex are not exhaustive. The objective is to identify hazards, their direct and indirect causes, and significant contributing factors.

B.2 Hazardous components, eg

a. Flammable substances; eg solid, liquid or gaseous.

b. Lasers.

c. Explosives.

d. Asphyxiants, toxic or corrosive substances.

e. High temperature or cryogenic fluids.

f. Hazardous construction materials.

g. Pressure systems.

h. Electrical sources.

i. Ionising and non-ionising radiation sources.

j. Hydraulic arms or rotational machinery.

k. Other energy sources including those due to motion.

l. Exhaust gases.

m. Passive obstacles.

n. Hazardous surfaces.

o. Cut and puncture projections.

B.3 Safety related interfaces between the various elements of the system, eg:

a. Material compatibilities.

b. Electromagnetic interference and compatibility.

c. Inadvertent activation.

d. Fire and explosion initiation and propagation.

e. Hardware and software controls.

B.4 Factors due to the operating domain, or that the system may add to the operating domain, eg:

a. Drop.

b. Shock and vibration, including seismic.

c. Extreme temperatures, pressures and climatic conditions.

d. Noise.

e. Exposure to toxic or corrosive substances.

f. Fire or explosion.

g. Insect, rodent or mould damage.

h. Foreign bodies and dust.

i. Electrostatic discharge including lightning.

j. Electromagnetic interference.

k. Ionising and non-ionising radiation, including laser radiation.

l. Faults in supporting systems; eg power supplies, hydraulic systems.

m. Exhaust gases.

B.5 Operating, test, maintenance and emergency procedures, eg:

a. Operation under peace, exercise, war.

b. Human factors considerations.

c. Adequacy and effectiveness of instruction, training and rehearsal.

d. Health hazards.

e. User error, including failure to activate.

f. Effect of factors such as equipment layout, ergonomics and lighting.

g. Potential exposure to toxic materials, noise and radiation.

h. Life support systems.

i. Crash safety, egress, rescue and survival.

j. Repair and salvage.

B.6 Enemy action, eg:

a. Hostile acts.

b. Inaction of active protective systems.

c. Ineffectiveness of passive protective systems.

d. Damage containment.

B.7 Damage control measures, eg:

a. Damage containment.

b. Damage repair.

c. Hazard containment.

d. Egress, rescue and survival.

B.8 Facilities, eg:

a. Support equipment.

b. Training.

c. Provisions for storage of hazardous materiel.

d. Provisions for assembly of hazardous materiel.

e. Provisions for proof testing of hazardous materiel.

B.9 The adequacy of safety related equipment, safeguards and failure containment measures, eg:

a. Fire suppression systems.

b. Relief valves.

c. Energy containment vessels.

d. Electrical protection.

e. Toxic substance control.

f. Electrical, air and hydraulic supplies.

g. Personal protective equipment.

h. Ventilation.

i. Noise or radiation barriers.

j. Alarms and warnings.

B.10 The defences against common mode failure, eg

a. Systems redundancy and diversity.

b. Interlocks.

c. Fail safe design.

B.11 Compliance with systems safety guidelines and standards, eg:

a. Understanding of systems by personnel.

b. Incident recording and monitoring, including ``near misses''.

c. Operator deviation.

d. Design deviation.

e. Deviation in supervision and checking.

f. Component substitution.

B.12 Threats to programmable electronic systems, eg:

a. Viruses.

b. Security breaches.

Land Systems Hazard Checklist

No domain-specific Hazard checklists – use generic checklists.

Sea Systems Hazard Checklist

Naval Authority Key Hazards

a. • Structure
b. • Stability
c. • Escape and Evacuation
d. • Fire
e. • Propulsion and Machinery
f. • Explosives
g. • Submarine Hazards (Atmosphere Control, Watertight Integrity, Shielding)
h. • Ship/Air Interface (for embarked aviation)
i. • Navigational safety.

Aviation Hazard Categories	
Hazard category	**Key hazards assigned to hazard category**
1. Fire	• Fire
2. Explosion	• Explosion
3. Disruption	• Structural break up • EMC • Deliberate 3rd party • Incompatibilities (Procedures/Interoperability)
4. Human performance	• Design performance and handling characteristics of aircraft and systems in the air or on the ground. • Crew incapacitation • Congestion • Inappropriate competence • Inexperience • Inappropriate/Inadequate communication • Inadequate procedure • Unfit for duty • Lack of currency • In-discipline • Inadequate supervision • Human capacity Workload
5. Operating hazard	• Natural operating hazards • Man-made operating hazards • Inadvertent 3rd party
6. Survival	• Post accident survival
7. Environment[1]	• Noise • Vibration • Hazardous materials • Pollution • Emissions

[1] Assessment of environmental hazards should take place through the application of POEMS.

OME Hazard Checklist

See AOP-15 Ed2 (Stanag 4297 Ed2) "Guidance on the assessment of the safety and suitability for service of munitions for NATO Armed Forces"