

Building Sustainable (SMS) Models for the Future Operation of Defence Manufacturing Facilities

Authors

Garry Warrender, Benalla Facility Manager, NIOA

William Post, Chemical Engineer, Safety Management Services, Inc.

Scott E. Genta, Chemical Engineer, Safety Management Services, Inc.

November 2019

Presentation Outline

- The Issue Statements
- The Process
- The Solution
- The Future

The Issue Statements

1. How to expand Explosive Ordinance (EO) capabilities and technology in Australia?
2. How to best expand EO capabilities and technology under a “Single-User” arrangement on an existing EO manufacturing site?
3. How to ensure EO expansion meets all EO Safety and Regulatory Requirements?

The Process

- The Process
 - Discussion with all parties involved
 - Commonwealth
 - MHF License Holder (Existing Tenant)
 - Regulatory Agencies
 - How to implement expansion
 - What does it look like?
 - Structures and Responsibilities?

The Process – CHALLENGES

- Waste
- EO Magazines and Quantity Distance (QD)
- Emergency Planning and Response
- Building Maintenance (who / when)
- Incident Investigation
- Explosives Operation Licence
- Site Security
- Intellectual Property

The Solution

– Develop a **Safety Management System (SMS)** that satisfies:

- **EO Safety**

- Commonwealth Requirements
- State Requirements
- MHF License Holder (Existing Tenant)
- Other Regulatory Requirements

The Solution

- **The SMS must be robust!**
- Must adhere to explosive safety principles
 - Modelled after - AS/NZS 4801:2001 – Occupational health and safety management systems in line with requirements of VIC OHS Act 2004 and WHS Amendment Act 2017
 - CONTROL OF MAJOR HAZARD FACILITIES National Standard [NOHSC:1014]
 - Relied on AS/NZ-4804 & AS/NZ-4801 as well as US OSHA PSM Elements 29CFR 1910.119
 - Meet the requirements of the Dangerous Goods (Explosive) Regulation

The Solution

Key Components of the SMS

Fundamental Principles of EO Safety

1. **Understand the Nature of Explosives “In Process”, Storage, or Transportation**
2. **Thorough & Accurate Process Hazards Analysis (PHA)**
3. **Proper Facility Design and Siting**
4. **Site-Specific Explosives Safety Standards based on lessons learned and PHAs**
5. **Rigorous Process Control**
6. **Explosives Safety Systems and Protocols**
7. **Explosives Safety Accountabilities at all Organizational Levels**



SYSTEMS SAFETY

The System Safety Program Plan (SSPP)



**SYSTEMS SAFETY PROGRAM PLAN – Benalla
NIOA-SSPP-002**

Key Components of the SMS



The Solution

Key Components of the SMS Process Hazards Analysis (PHA)

- Applied proven Risk Management principles and practices
- Use a combination of deductive and inductive reasoning to identify failures
- Organized by Operation or Equipment
- Table Headings:
 - Failure modes for each item identified
 - Causes developed
 - Potential effect
 - Safeguards (***Focus on Design Safety***)
 - Qualitative risk assessment (MIL-STD-882E)
 - Recommendations

LINE NO.	OPERATION/ ITEM	FAILURE MODE	FAILURE CAUSE	POTENTIAL EFFECTS	SAFEGUARDS	HAZ CAT	RECOMMENDATIONS	HAZ CAT
Preparation of Facility								
1A	Removal of legacy equipment from building S6	Friction, impact, ESD or thermal initiation of energetic material	Residual energetic material or explosive ordinance/ articles left from previous occupant	Injury or fatality of personnel Localized initiation leading to fire or explosion Facility and equipment damage	A licensed contractor will be engaged to remove all equipment Contractors will receive hazard recognition and explosive safety training for decontamination, disassembly and demolition activities A trained and experienced NIOA safety representative will be onsite during all equipment removal activities (a condition of handover)	2D	Thales Activity to manage prior to NIOA occupancy. Actioned by Thales before January 2019	2D
1B	Removal of legacy equipment from building S6	Friction, impact, ESD or thermal initiation of energetic material	Use of unapproved tools AND	Injury or fatality of personnel Localized initiation	Unlikely that any bulk energetic material is present The permit to work system will be	2D	Thales Activity to manage prior to NIOA occupancy. Actioned by Thales before January 2019	2D

The Solution

Key Components of the SMS OHS Management Plans

- BHSE-001 Safety Committee Charter
- **BHSE-002 Explosive Safety Standards**
- BHSE-003 Standard Operating Procedures / Work Instructions
- BHSE-004 Risk Management Procedure
 - BFO-005 Hazard and Risk Identification Worksheet
 - BFO-006 Hazard Identification Checklist
 - BFO-007 Hazardous Substance Risk Assessment Record
 - BFO-011 Plant Hazard Identification Checklist
 - BFO-012 Risk Assessment Worksheet
- BHSE-005 Training and Competency Including:
 - PE-002/12 Training Record
 - PE-002/23 Training Record Group
 - PE-002/25 Training Feedback Form
- **BHSE-006 Management of Change**
- BHSE-007 Clearance to Work Program
 - BFO-008 Hot Work Permit and Checklist
 - BFO-013 Clearance to Work Permit
- BHSE-008 Emergency Preparedness and Response
 - BFO-001 Emergency Evacuation Checklist
 - BFO-002 First Aid Kit Contents Checklist
 - BFO-004 Evacuation Drill Checklist
 - BFO-014 Assessing First Aid Requirements
 - BFO-015 First Aid Treatment Register
- BHSE-009 Incident Investigation including:
 - BFO-009 Incident Investigation Report
 - BFO-010 Incident Report
- BHSE-010 Security Plan
 - EX-000 Explosive Security & Risk Management Plans & Procedures
 - BSSO-000 Security Standing Orders Manual
- BHSE-011 Health Surveillance
- BHSE-012 Housekeeping
- BHSE-013 Electrical Safety
- BHSE-014 Personal Protective Equipment (PPE)
- **BHSE-015 Lock Tag Try**
- BHSE-016 Fatigue Management
- BHSE-017 Waste Management
- BHSE-018 Fitness for Work and Pre-Employment Screening
- BHSE-019 Magazine and Transport Operations
- BHSE-020 Contractor Safety
- BHSE-021 Mechanical Integrity
- BHSE-022 Electrical Test and Tag
- BHSE-023 Foreign Object Debris Control
- **BHSE-024 Confined Space Entry**
- BHSE-025 Safety Management System
- BHSE-026 Environmental Management Plan

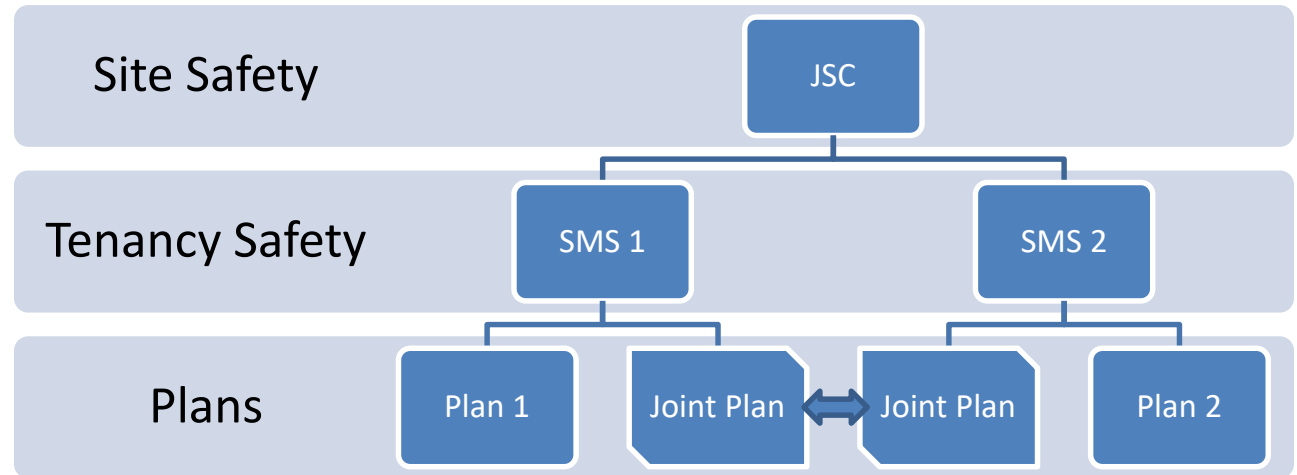
The Solution is Multi-tenancy

- Modelled after - AS/NZS 4801:2001 – Occupational health and safety management systems
- Meet the requirements of the Dangerous Goods (Explosive) Regulation
- Incorporating Explosive Safety Principles throughout the plan
- Understanding of Multi-Tenant facilities
 - International Standards
 - Frameworks for Collaboration
 - Understanding of existing facility Quantity Distance requirements
- Key Components of EO System Safety Plan
 - Risk Management
 - Explosive Safety Protocol
 - Emergency Preparedness and Response
 - Work Authorization (Explosives Operations)

The Future

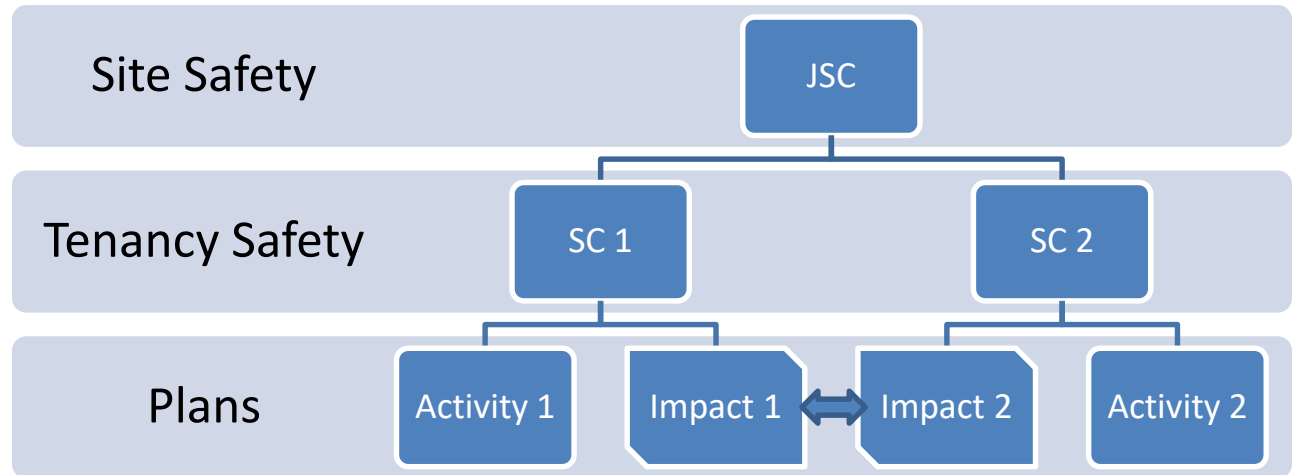
- “Multi-Tenancy” = two or more Manufacturing licences “side by side”
- Still have other challenges (How to work effectively together?)
- Is it feasible to operate under the same Safety Management System?

The Multitenancy Safety Management System



- Emergency Management Planning
- Workflow Planning and Coordination
- Awareness

The Multitenancy Safety Approach



- Communication
- HSE Review - Impact Assessments
- Staged Workflows – if required
- Emergency Management Planning

Any Questions?

