

**Failure Modes and Effects Analysis (FMEA) for Propellant Powder Production
Conducted for a Generic Company**

LINE NO.	ITEM	FAILURE MODE	FAILURE CAUSE	POTENTIAL EFFECTS	DESIGN SAFETY	HAZ. CAT.	RECOMMENDATIONS	HAZ. CAT.
1.	<u>GENERAL CONCERNS</u>							
2.	Tools	Impact initiation of energetic dust <ul style="list-style-type: none"> Dropping hard metal tools with energetic powder present 	Using hard metal tools around energetic powder <ul style="list-style-type: none"> Failing to clean energetic powder spill before introducing other tools to the area 	Local fire Propagation of fire to out-of-place energetic powder in the area Severe personnel injury	None	2D	Add to Standard Operating Procedures: 1) Verify that tools are clean of powder before using (SAR GEN-02)	2E
3.	Energetic Dust On Floor	Friction/ impact initiation of energetic dust	Personnel walk on dust that has fallen to the ground. Contact with powder made with rock on bottom of shoe <ul style="list-style-type: none"> Failure to clean shoes before entering the area 	Local initiation Propagation of fire to out-of-place energetic powder in the area Severe personnel injury	Had a bar to hold on to while cleaning off shoes on a mat just outside building Friction TIL values for this energetic dust shows material is relatively insensitive to friction. Impact TIL values for this energetic dust shows material is relatively insensitive to impact.	2D	Provide a mat or other means of cleaning off shoes at the entrances to all processing buildings (SAR GEN-08) Add to Standard Operating Procedures: 1) Clean/ wipe the soles of your shoes before entering a processing building, this will help ensure the shoes are conductive and that rocks or other contaminants are not brought into the building (SAR GEN-03)	2E
4.	Explosive Safety Standards	Personnel injury from equipment/ process/ facility failures	Lack of Explosive Safety Standards <ul style="list-style-type: none"> Equipment/ facility/ process issues are not adequately addressed or protected against 	Fire/ explosion Facility damage Personnel injury or death	None	1D	Develop Explosive Safety Standards for the process that include facility design, facility siting, and equipment/ tooling specifications (e.g. surface finishes and welds, materials of construction, etc.) (SAR GEN-09)	2E