

EXAMPLE FAILURE MODES AND EFFECTS ANALYSIS (FMEA) FOR PROPELLANT POWDER PRODUCTION

LINE NO.	OPERATION/ ITEM	FAILURE MODE	FAILURE CAUSE	POTENTIAL EFFECTS	SAFEGUARDS	HAZ CAT	RECOMMENDATIONS
15A	Transfer of Propellant between Drums	ESD initiation	Charging of propellant during pouring	Initiation of energetic material with injury or fatality of personnel Equipment/ facility damage	Planned operation includes grounding the top rings of the two drums prior to transfer of propellant	1D	None
15B	Transfer of Propellant between Drums	Friction/ impact initiation	Contact between rings with residual propellant or drums are dropped on spilled propellant	Initiation of energetic material with injury or fatality of personnel Equipment/ facility damage	It's unlikely that material will be present on the lip of the ring surrounding the drum and it's also unlikely that pouring of propellant would occur with significant metal-to-metal contact	1D	None
15C	Transfer of Propellant between Drums	Initiation of out-of-place energetic material	Spill of propellant during propellant transfer	Initiation of energetic material with injury of personnel Equipment/ facility damage	Amount of material transferred between drums is small	3D	None
15D	Transfer of Propellant between Drums	Personnel exposed to hazardous operation	Lifting of propellant drums	Injury of personnel	Weight of nearly empty drum is less than the maximum allowed	3D	None