INVESTIGATION REPORT

(Direct all communications to secretariat@safex-international.org)

INCIDENT NOTICE NO.	INVESTIGATION REPORT NO.
18-07	895

1. **DATE AND TIME OF INCIDENT (When?)**:
   19.06.2018 at 06.50 PM
2. **INCIDENT LOCATION:**
   a. **Company name**: SOLAR INDUSTRIES INDIA LIMITED
   b. Company facility: PP-06, Chakdoh, India
   c. **Process outline**: Cleaning operation of outlet line of pressure filter to crystallizer & settler, HMX manufacturing.
3. **DESCRIPTION OF INCIDENT:** On 19.06.2018 during B-Shift at around 06.50 PM, there was an explosion in PP-06 (HMX Manufacturing Plant). This occurred during the cleaning operation of the outlet line of pressure filter to crystallizer & settler, which was being carried out by an operator and a helper. No production was going on at that shift.The helper tried to clean the line after removing the view glass at mezzanine floor. In this process, the explosion occurred which resulted in the helper sustaining serious injuries to the right part of his body. He was immediately rushed to hospital at Nagpur by ambulance. He was declared dead on arrival at the hospital. by the doctor. There was no injury to the operator.
4. **IMPACT OF INCIDENT:**

   One fatality occurred. Damage to ball valve with actuator, pipe bend, air lines, flexible pipe, sight glass, flanges, window (wire meshed) & pipeline. No damage to any processing vessel.
5. **LIKELY CAUSE OF INCIDENT:**
   1. Non-adherence to operating procedure for clearing blockage in pipelines used in transferring explosives.
   2. Lack of supervision .
6. **ACTIONS TO PREVENT RECURRENCE:**
   1. Dechoking of pipelines should be done very carefully and detailed procedure should be documented including use of non- sparking tools and proper decontamination by immersing in solvent. If required, the pipeline should be dismantled.
   2. Such type of job to be carried out in day time under supervision / guidance of Plant Head, Safety and Maintenance personnel.
   3. Specialist advise should be taken to ensure no chokages take place by modification of the existing line network.

4. Insulation can harbor several kilograms of explosive over the years and hence the tracing of pipes could be considered as a better alternative.
5. Periodic retraining of operators & supervisors on Basis of Safety.

7. LEARNING POINTS:

1. Production of HMX was not being done but the process of aqueous solvent water stripping in crystallizer was being carried out from 02.30 PM to 05.30 PM on that day.
2. The supervisor observed accumulation of HMX in the view glass of pressure filter bottom line towards crystallizer & settler. He assigned the job to clear the chokage to an operator with a helper.
3. The documented authorized procedure was to wet the deposited HMX with solvent and then allow for sufficient time to dissolve/ loosen the solidified HMX and then gently clear using Teflon rod. However, use of brass rod for clearance of the chokes was done a few times in the past.
4. As per the statement of the operator, after opening the view glass using a spanner & screw driver, the operator told the helper that he was going to get solvent for pouring into the choked pipeline and a Teflon rod for clearing the choke. He asked the helper not to do anything in between, however, just after he left the room he heard an explosion.
5. The screw driver was found lying on the mezzanine floor having a bent near the mouth. A spanner also was found on the floor. CCTV footage indicated that the helper was trying to do some activity on the choked pipe just before the explosion.
6. Based on this it appears that the helper tried to clear the choke by applying force on the choked HMX, possibly using the screwdriver, which resulted in explosion.
7. The fact that right side of the helper's body got in the line of fire and bore the brunt of the explosion, explains that he was trying to apply force with his left hand, because he was a natural left hander.
8. The operators, the supervisor and the manager knew about the hazards of application of force on HMX particularly by metal to metal impact, but for some unknown reason the helper tried to use force with a screw driver.
9. The insulation on the pipelines had caught fire which delayed the rescue work by some important minutes. That highlights the importance of sprinklers. Insulation prevents inspection in case of leakage and also there are risks of accumulation of explosives in the insulations.

8. OFFICIAL REPORT: No

9. ORIGINATOR:

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