

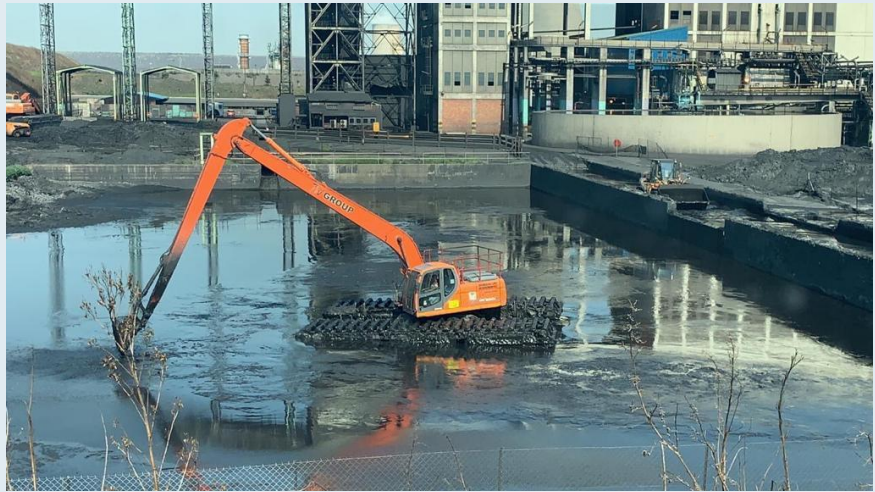
GROUP SHE LEARNING

OPERATOR DROWNS AFTER AMPHIBIOUS EXCAVATOR CAPSIZES

Learning number	OS 051 / 19-20 - L											
Operating Entity	Secunda Synfuels Operations, Outside Ash, Fine Coal Dam											
Date of incident	7 April 2020											
Incident Type	Occupational Safety	Process Safety	Environment	Product Transportation	Health	Security	Equipment Damage	Other				
	X						X					
Life Saving Rule												
									X	X		
Key Undesirable Event	Loss of separation between people and on-site body of water											
Description of the incident	A service provider employee used an amphibious excavator to excavate soil and water samples from a fine coal dam. On route to a sample point the excavator inadvertently entered deep water and started floating. In an attempt to find shallower water, the operator extended the excavator boom towards the left and pushed the excavator bucket into the water. The excavator started tilting towards the side and dipped into the water. The supervisor gave an instruction via two-way radio for the operator to stop and the operator responded by quickly retracting the excavator boom causing the excavator to lose balance and capsize in the water. The operator (wearing a life jacket) was trapped underwater inside the inverted operator cab. Two supervisors were able to retrieve him from the operator cab however, team members and medical personnel were unable to resuscitate him.											

Incident photos

The amphibious excavator at work at inside ash



The amphibious excavator after it capsized at outside ash fine coal dam



Underlying and root causes

Root cause 1: Management system failure: risk identification, mitigation and planning

The depth of the dam was an important factor and it was known that certain areas of the dam were deep. However, the risk of the depth of the dam was not considered and the risk of the excavator capsizing was underestimated during the planning of the work. Therefore, inadequate preventive and corrective actions were developed in the task risk assessment and the potential deviation analysis.

Root cause 2: Management system failure: training and competency

The operator was experienced in operating normal excavators however, no documented proof was in place to indicate that the operator had been properly trained and assessed in the safe use of an excavator in an amphibious configuration and especially in deeper water scenarios.

Root cause 3: Management system failure: safe operating procedures

The service provider safe operating procedure placed the onus on the operator to decide how deep the machine can go while under supervision. The original equipment manufacturer (OEM) operating manual has clear limitations with regards to water levels, however these were not integrated into the service provider safe operating procedures.

Root cause 4: Management system failure: supervision

The supervisor of the task relied solely on two-way radio communication to give guidance to the operator regarding the safe operating parameters of the excavator in floatation mode. This control was ineffective in preventing the excavator from capsizing furthermore it was found that the supervisor had no specific training and competence that was required to safely and effectively supervise this specific task.

Key learning and control improvement recommendations	The safe use of an amphibious excavator is dependent on the water level depth and the provision of additional attachments [spud piles and supplementary pontoons] in deeper water conditions. Although amphibious excavators have the ability to float, they are unable to execute work while floating. Using the excavator boom while in floatation mode can cause the excavator to become unstable. Amphibious excavators have specific water level depth limitations, and these are predefined by the original equipment manufacturer. Correct application of the potential deviation analysis (PDA) process allows for proper risk evaluation. The PDA is a tool used to evaluate a predefined plan or method statement as compiled by the executor of the task. The PDA should include all relevant stakeholders and subject matter experts. The PDA is not the platform for developing a plan or conducting a task risk assessment. Preventive and corrective controls should be aligned and appropriate to the identified risks. Consult with independent subject matter experts when dealing with unfamiliar, specialised equipment or work methods. When planning to conduct high risk activities especially those that are non-routine or unfamiliar to the operations, it is recommended to consult with independent subject matter experts to provide objective input into risk assessment processes. Supervisor competency. Supervisors should have the necessary competency and experience to manage the safe execution of specialised tasks.
Identification of standard or good practice related to the incident	None
To prevent future incidents, it is recommended that this incident learning is appropriately shared and implemented by relevant persons in your Operating Model Entity, where applicable.	
Together towards ZERO HARM and SUSTAINABILITY	