# PSU

## *Pig Signalling Unit*

### Applications

SA Radiation's Pig Signalling Unit (PSU) is a subsea system capable of:

- Counting pigs (transits)
- Hunting pigs (even in buried pipelines)

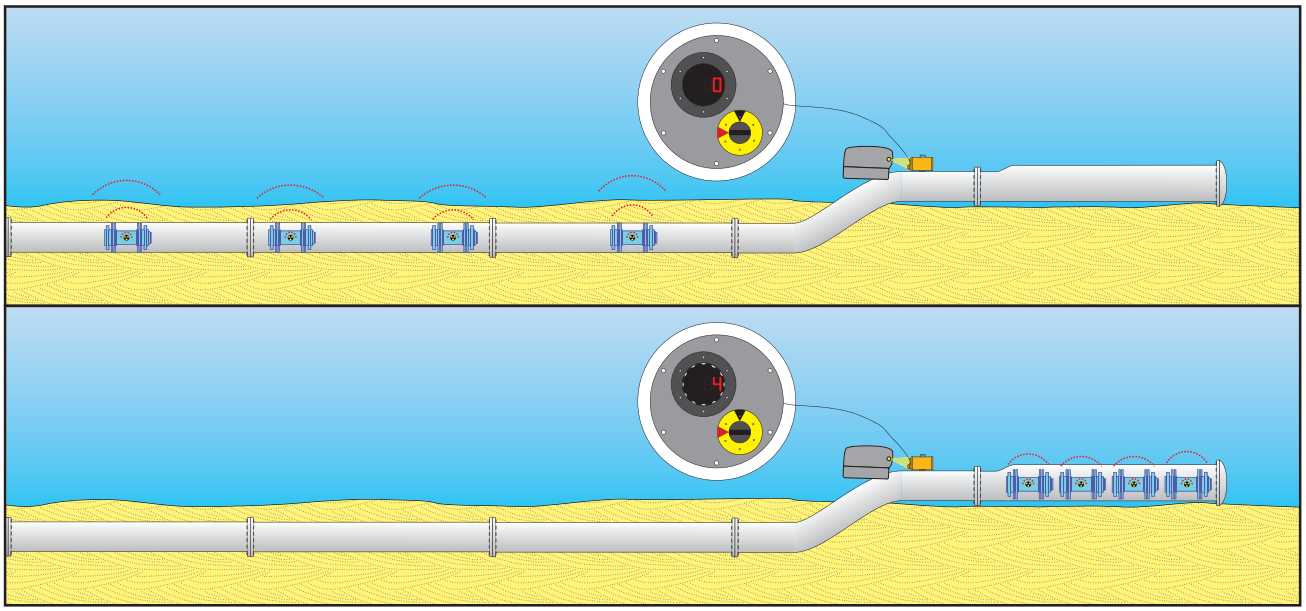

### How it works

Radioactive sources emitting gamma rays are carefully selected for each pigging operation. The sources are loaded into the pigs prior to deployment. Even though steel, water, sand, concrete and rock may lie between the PSU and a pig, the gamma rays (which may be quite weak) can still be detected by the PSU.

### Reliability

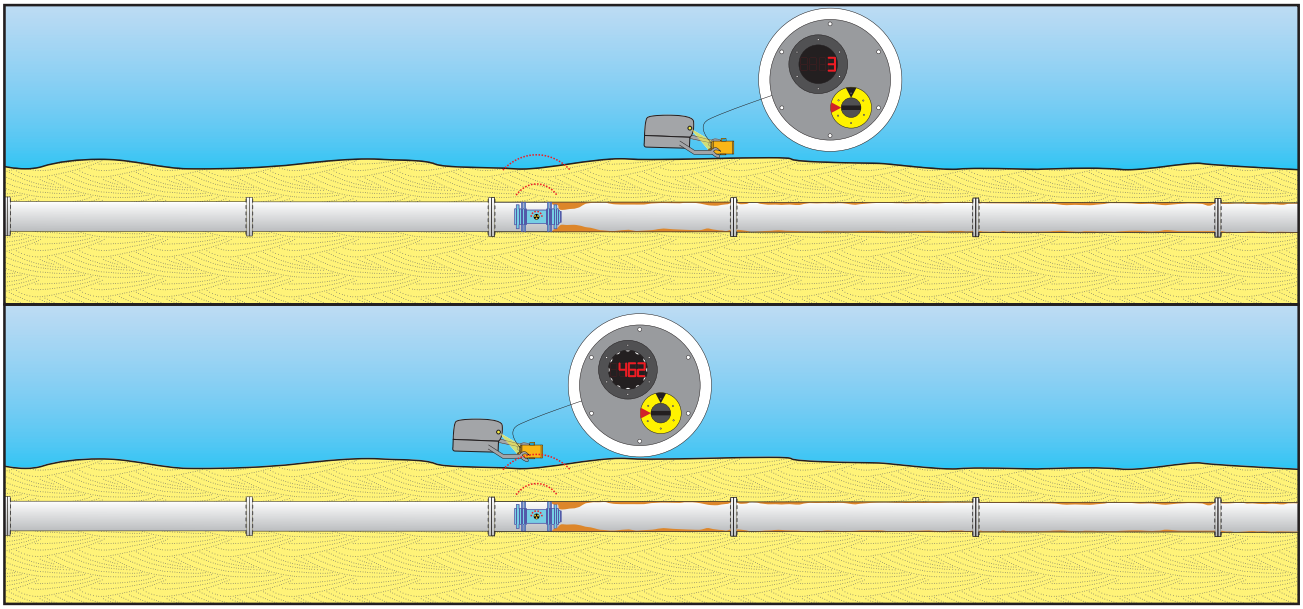
The PSU design has undergone extensive reliability, endurance and ruggedness testing in both laboratory and field trials. In 2016 the PSU was successfully used for a pipeline pigging operation in the Timor Sea to detect the transit of 8 pigs.

### Counting Pigs




The PSU is positioned by a remotely operated underwater vehicle (ROV) to any location on the pipeline to count and confirm the transit of one or multiple pigs.

## Hunting Pigs



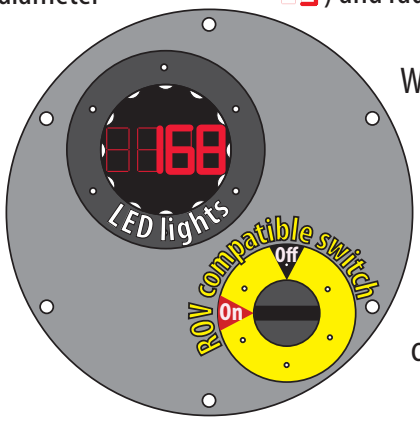
The PSU is transported by the ROV along the buried pipeline to identify the precise location of missing or stuck pigs.

## Specifications and Performance

- Pig speed range: 1m per hour to 30km per hour
- Minimum separation time between pigs: 1 second
- Dimensions: 360mm length x 280mm diameter
- Total mass: 35kg (non buoyant)
- Maximum operating depth: 1000m
- Operating temperature: 0°C to 50°C
- Lithium batteries
  - 400 hours continuous operation
  - 2000 hours standby time
- ROV compatible switch

## Display

The large (75mm diameter) window allows the use of large red LEDs to display total pig counts (using 2 digits: 5) and radiation level (using 4 digits: 168).




When a pig transit is detected, ultrabright white LEDs switch on for 5 seconds. Every 30 seconds the same white LEDs flash once for each pig transit. The flashes assist with pig counting when ROV visibility of the display is compromised due to water turbidity.

## Data Management

The program automatically runs when the system is powered up. In less than 2 minutes of switching on, the PSU is operational. The PSU continuously records pig counts and radiation levels. The system can be turned off and restarted at any time using the ROV compatible switch.

SA Radiation's unique threshold algorithm has been specifically developed to prevent false pig transits (due to slow pig transits or gamma ray fluctuations) and missed pig transits (due to two pigs transiting close together).

The following data is recorded every second to a USB thumb drive: Date, time, pig counts, radiation level (cps).