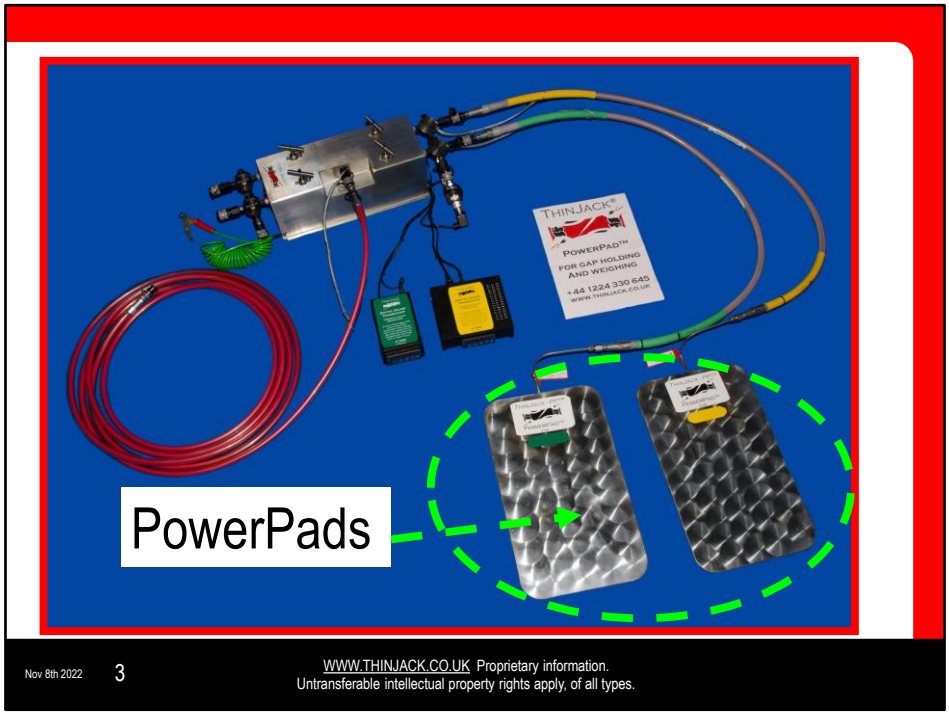
PowerPad™

Gap Holding & Pre-Lift Weighing

For this service, we were approached by companies with a challenge, rather than recognising a need ourselves.
Good afternoon. Guy Bromby from ThinJack.

Could you Weigh the PLATFORM TOPSIDES before removal ?



- Yes!
- You see the hydraulic manifold, hoses and pressure displays above the PowerPads
- Think of a steel envelope inflated with hydraulic pressure.

- We know the dimensions of these A3 sized PowerPads
- We know the pressure inserted into them.

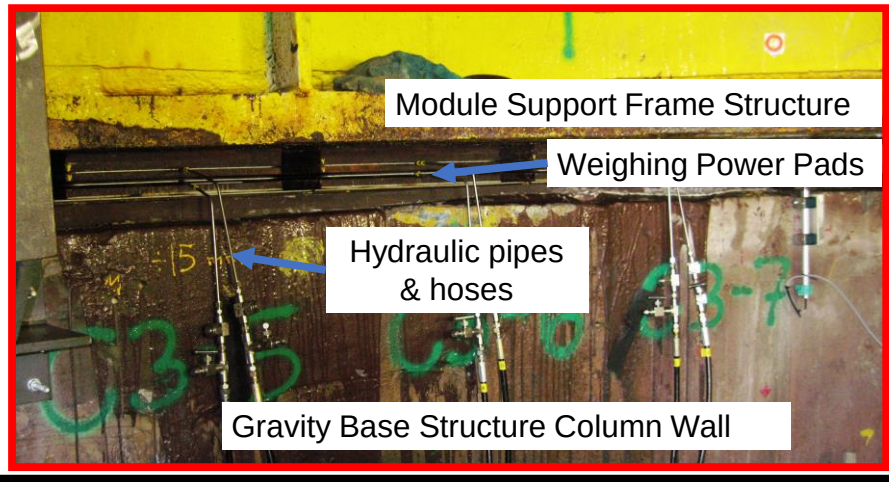
- And because F = P x A, we have a set of weighing scales.
- This is a cut down system size to aid clarity

Steel PowerPads:

Inflated: 11 mm thick with 50 bar pressure

NOT Inflated: 3 mm thick

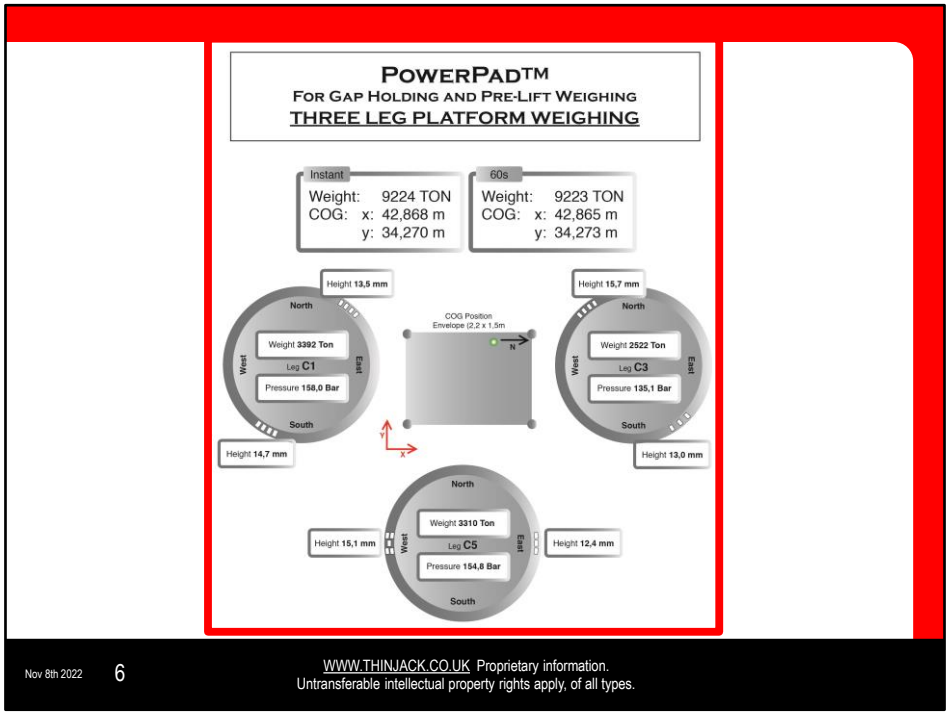
On the left, in green, you see the chamfer, or bevel, on the Steel PowerPad, showing the 11 mm inflated expansion compared with the 3mm thickness of the uninflated PowerPad on the right.



- If you look at the upper blue arrow, you see the edge of the PowerPads inserted between the module support frame and the gravity base structure column wall.
- The PowerPad weighing system, with its sensors and custom-designed software, accesses and displays individual pad load readings to the system operator in the control room. This is in real time.

The system:

- Calculates the total load and the centre of gravity of the module for weighing.
- Allows the safe lifting and transport of large and heavy structures by determining the deadweight.
- Enables use of smaller lift vessels and cranes, where there is less supply
- Confirms the optimum the best position of the lifting points to keep the structure stable during the lift.



- Displaying mass and the XY centre of gravity in the 2 smaller rectangles, one “instant” and the right one averaged over 60 seconds..
- You can see the circular legs of the three legged platform, with the individual weight, pressure and gap filled by the PowerPads.
- This data is from a from a screen shot on 22nd April 2007.

A Second Project:

- **A thin, inflatable & intelligent shim system enabling controlled support of a gap created by a wire cut, or similar.**

Without it: Think of how a saw jams in partially cut wood.

- **On cut completion, the PowerPad supports the upper structure and weighs it.**

Project 2
PowerPad was tested in July 2014 and held open an 11mm high gap for a diamond wire as it cut through the concrete block. This was held in a compressive test frame under 500 tonnes of load to simulate a scaled down structure offshore.

- The top left hand picture shows the diamond wire mostly cut through the concrete block.
- The PowerPads were fitted as the cut progressed and the gap held open with these intelligent, inflatable shims, seen on the right photograph and only visible once the cut is complete and the upper part of the concrete removed.

The aim was to test the support of the cutting gap after the cut had reached a critical 65% cut stage, where previously the concrete mass had cracked and then collapsed, thereby jamming and breaking the cutting wire.

A series of four pads, each of which at 3mm thickness un-inflated were thinner than the wire cut gap, were inserted into the gap created by the diamond wire once it had passed sufficiently through the concrete block. These were then inflated and the pressurised water inside locked in. By working in this passive mode, the pads retained their shape and withstood the force from the concrete block. They held

open the wire gap right the way through to the end of the 3 ½ hour cutting process, supporting the concrete mass and the 500 tonnes of pressure from above.

THIS REPLACES THE STATUS QUO:

1. Mass and centre of gravity assessment of a platform or other object, from historical records
2. “No need”. (Some heavy lift vessels have so much lift capability that accurate “pre-lift weighing/centre of gravity” may not matter).

This service allows: use of smaller lifting vessels, and carbon footprints, for topside platform decommissioning, where mass and centre of gravity display is either critical or helpful.

Problem solved, compared with the Status Quo

USED BY

1. **Frigg platform, 9225 tonnes. Norway, 2007. Total.**

2. **Onshore UK, commercially funded 500 tonnes test assessing the feasibility for platforms' subsea concrete leg cutting, June 2014.**

https://www.thinjack.co.uk/gap-holding-weighing/