INITIVO
Testing Engineering Consultancy

Drop Testing

Overview

Initivo (formerly VINCI Technology Centre UK Limited) have been in the nuclear sector since 1950's. Our involvement started with the construction of the world's full-scale first commercial nuclear reactor at Calder Hall (now Sellafield).

Our team is made up c.90 engineers, scientists, and technicians.

We have been providing top quality drop testing services since the 1990's, previous examples include:

- 6 tonne flasks from 10 metres
- Various 3m^3 7t boxes from up to 25 metres
- 12t box from 15 metre

Accreditation

- UKAS accredited test laboratory to ISOI/IEC 17025
- Quality: ISO 9001:2015
- Environment: ISO 14001:2015
- Health & Safety: BS OHSAS 45001:2018

Member of NIA Nuclear Industry Association

Facilities

- 5.5-hectare campus
- 3,600m^2 heated indoor workshop
- On-site craneage and plant
- In-house fabrication
- Secure site

We have a 200t indoor target, allowing our clients to work in a controlled environment

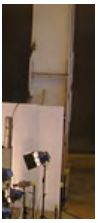
Instrumentation

- Accelerometers
- Strain gauges
- Deflection/pressure transducers
- Load cells
- High speed photography
- High speed data acquisition
- Metrology

Flexibility

If we need a bigger target...
we will build one.

We can build and test anything.



Case Study | 3m^3 Box

NUCLEAR SECTOR

Drop testing was carried out to demonstrate the performance of a concept waste container. Three tests were performed:.

- Flat drop
- Edge
- Corner

VIDEO

High-speed video was recorded on two axes. The systems recorded at 1000 frames per second. A trigger pulse was used to start recording and the recordings were synchronised with data acquisition by the use of the same trigger pulse.

Weight:	c. 5 tonnes
Drop Height:	10.5 metres
Target:	Complied with IAEA Regulations: TS-R-1 2005 edition and TS-G-1.1 (ST-2) 2002 edition

METROLOGY

A portable measurement arm was used to measure the dimensions of the container before and after the drop. The measurements taken included:

a) Changes to major dimensions (height, breadth and width).

b) Changes to the four major corner to corner diagonals

c) Knockback at the impact point

d) Out of plane movement between top flange plate and the lid

ACCELEROMETERS

Four accelerometers were installed for each drop. The accelerometers were mounted vertically using purpose made mounting blocks bolted to the container. These provided a mounting surface at the specified orientation for each individual test and also provided protection to the accelerometers during any secondary impacts.

DATA LOGGER

All instrumentation was coupled to a data logger. This was controlled via software and communicating with 16 bit ADC's with single ended analogue input channels and in-built anti-aliasing filters. Data was streamed to the controlling computer and saved for future analysis.

Sampling was at 50,000 samples/second. All data logger equipment was connected to an uninterruptible power supply unit.

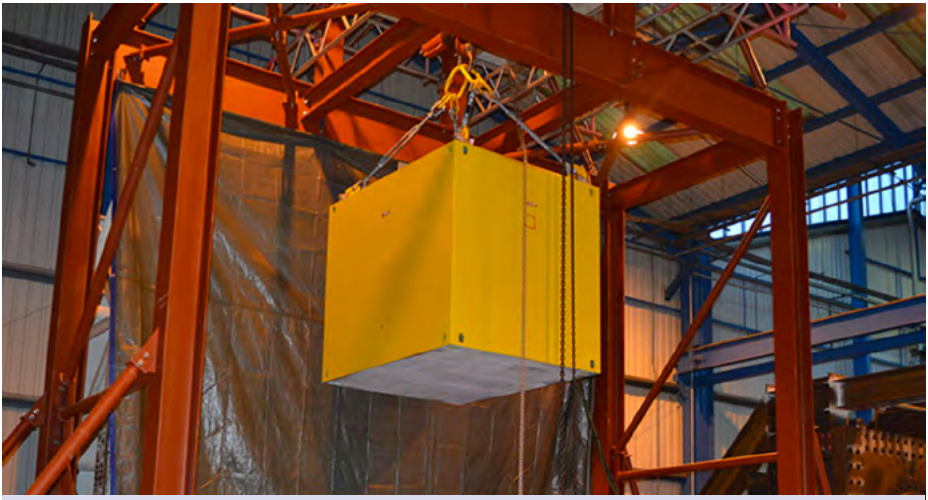
Case Study | Ductile Caste Iron Container

DCIC DROP TEST

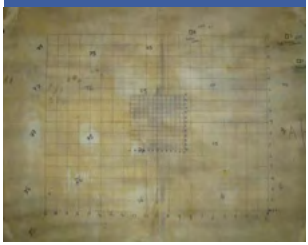
Initivo were commissioned to carry out a drop test on a Ductile Cast Iron Container (DCIC. This was was dropped onto an aggressive, punch-type, target. The purpose of this test programme was to provide test data from the drop test to allow validation of Finite Element Analysis modelling.

Box Preparation included:

- Paint removal
- Grid Measurement
- Magnetic Particle Inspection
- Ultrasonic inspection
- AC Field measurement
- Faro Arm measurement
- Commissioning trial



Dimensions:	Approx. 1600mm x 1700mm x 2000mm
Weight:	c. 18,000 kg
Drop Height:	5 metres
Target:	Compliant with IAEA Safety Standards TS-R-1 2009 edition

Domed Target	Container After Grit Blasting	Grid Marking
		

Instrumentation included:

- 11 Strain gauges
- 5 Accelerometers
- Data Logger (50,000 samples per second)
- High-speed video (2 axes - 1,000 frames per second)



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