



NICCO ENGINEERING SERVICES LIMITED

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VALTEST TECHNOLOGY

SAFETY VALVE TESTING & CALIBRATION



Valtest Technology - Definition



What is a **Safety Valve**?

A valve that open automatically to relieve excess pressure from the system when system pressure exceed to it's predetermined set value to save the system.

What is **Valtest**?

It is a kind of technology where calibration of spring loaded safety valve can be possible by using a computerized machine without affecting production or taking a expensive shutdown.

Components of Valtest Equipment

1 PULLING DEVICE

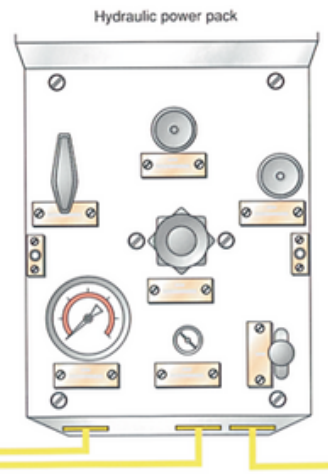
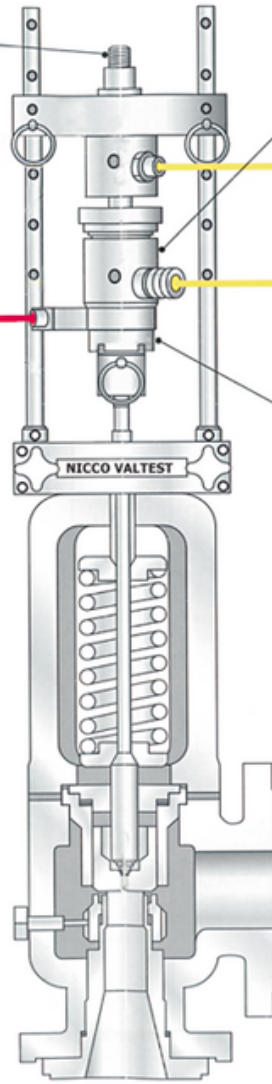
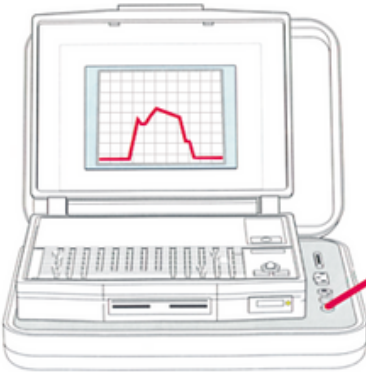
Floating spindle allows valve to operate normally during the short test.

Closing cylinder available if valve fails to reset on its own.

Load cell measures force applied to valve spindle.

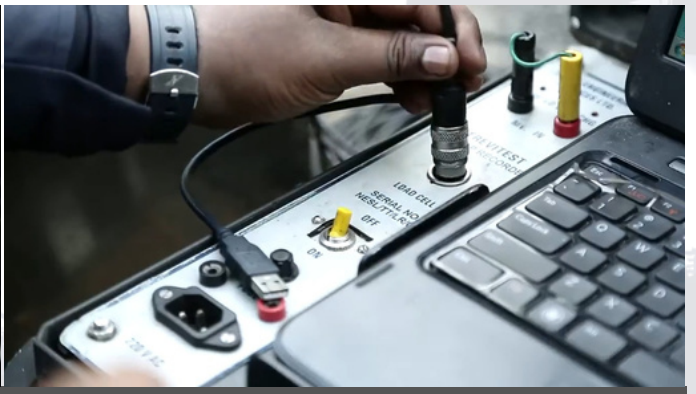


Computer



2 LAPTOP RECORDER

3 HYDRAULIC POWER PACK



Principle of Valtest Method

1. Keep system pressure as stable as possible.
2. Install the pulling device on the top of the safety valve.
3. Hydraulic power pack, which is operated by plant air pressure of 5 to 7 kg/cm² supply hydraulic oil pressure to the Ram located in the pulling device.
4. Hydraulic Ram displaces vertically upwards to overcome the valve spring tension and causing the valve to lift.
5. The force applied during this operation is measured using a strain gauge load cell and recorded in a Laptop Recorder.
6. At the time of lift, a surge or change of slope is observed in the graph.
7. The applied force divided by seat area gives the extra pressure (EP).

$$SP = EP + LP$$

SP = Safety Valve Set Pressure

EP = Extra Pressure

LP = Line Pressure

Test Procedures & Comparison



Hot Testing

Applied Force = Extra Pressure x Valve Seat Area

$$F = (SP-LP) \times A$$

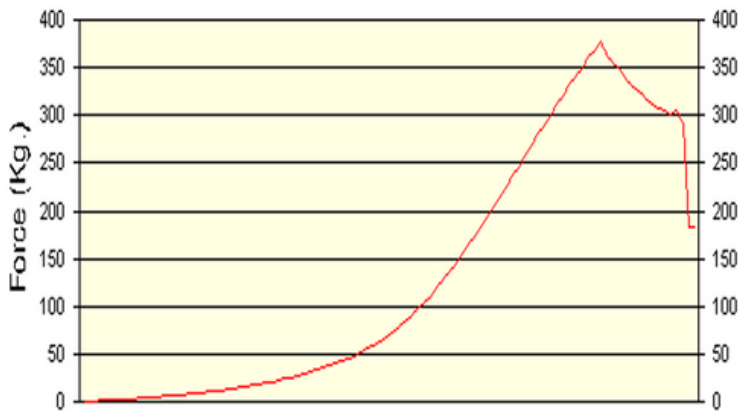


Cold Testing

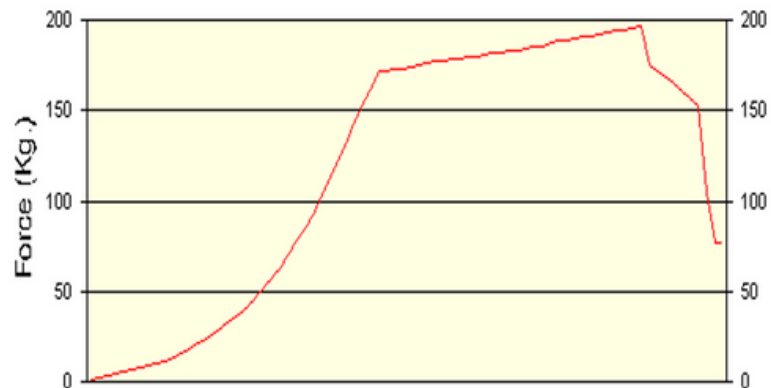
Applied Force = Set Pressure x Valve Seat Area

$$F = SP \times A$$

Hot-Testing Graph



Cold-Testing Graph



Conditions For Testing

1

A valve should have projected threaded spindle for fixing adaptor.



2

Normal Capacity :

Extra Pressure x Seat Area \leq 2000 Kgf

3

High Capacity :

Extra Pressure x Seat Area \leq 4500 Kgf

Advantages of Valtest

1. Fuel costs & testing time reduced, as during Valtest no need to over-pressure the boiler/system.
2. Hydraulic power pack, which is operated by plant air pressure of 5 to 7 kg/cm² supply hydraulic oil pressure to the Ram located in the pulling device.
3. Valve seat erosion will be reduced.
4. Welded in valves can be tested without removal from the line.
5. No need for temperature compensation to set pressure during hot testing.
6. The possibility of tube leakage for old boiler during conventional testing, can be avoided using Valtest.
7. Sound pollution can be reduced by Valtest.
8. Valtest is faster, quicker and more economical.

Calibration, Approval & Accuracy of Test



CERTIFICATE OF **CALIBRATION**

All testing kits are calibrated from Government of India laboratory , e.g. NTH, ERTL.



APPROVAL FOR **ONLINE TESTING OF SAFETY VALVES**


NESL is NTPC approved service provider and BHEL approved Trevitest/Valtest Method for online safety valves testing through their issued technical circular.





ACCURACY OF **VALTEST METHOD**


Test results accuracy is $\pm 1\%$


Valtest Vs. Electrical Method

 Our Valtest machine is fully hydraulic and operated by an air driven pump, which exerts a continuous force on the valve spindle assembly & thus allows for a smooth movement of valve's disc. Alternatively, an electrical /servo motor driven machine operated through a planetary gear box with rack & pinion arrangement may not have smooth movement of valves' disc all the time. This can lead to a damage of both valve's disc & seat.

 **Execution Time:** The Valtest machine is fully hydraulic and provides for faster execution compared to an electrical machine. Online safety valve testing is an energy saving principle, so time of testing is a key to effective use of this technology.

 **Problem of Electrical Operated Method:** In an electrical machine, harmonic interference cannot be completely eliminated from nearby high tension or low tension electrical power which is not a problem in Valtest method as our machine is fully hydraulic.

 **Use of Valtest at all climatic condition:** Valtest being a hydraulic operated machine is resistant to any climatic condition and is known for its safe use in case of testing during wet condition such as in rain. But Electrical method, it cannot be used safely during wet conditions. So in such case it does not serve the actual technology of being an energy saving principle and save both energy & time. The Laptop Recorder of Valtest equipment uses a most modern laptop which is protected from, dust, humidity, high temperature & any sound interference (generated at the time of valve lift).

 **Failure Chance:** Valtest Recorder has two independent channels to take care of failure of one channel in the field during working. On the other hand electrical operated pulling mechanism is having a chance of failure. In such case there will be a continuous blowing because of Valve hang up.

Recent Testing References


NESL has successfully conducted safety valve calibration and testing at the following plants;

SL No.	Plant Name	Location
1	NTPC Limited	Mouda
2	Adani Power Limited	Tiroda
3	Tata Power Com. Limited	Mundra
4	DVC Limited	Mejja
5	CPCL	Chennai
6	HPCL	Vizag
7	IOCL	Mathura
8	BPCL	Mumbai & Dibrugarh
9	HPL	Haldia
10	GAIL	Vijaypur & Pata
11	RIL	Jamnagar, Jamnagar SEZ & Jamnagar DTA

Detailed references are available on request.

Performance Certificates

चेन्नई पेट्रोलियम कॉर्पोरेशन लिमिटेड
(इंडियन-ऑयल की दूर कम्पनी)
Chennai Petroleum Corporation Limited
(A group company of IndianOil)




Ref: TSD- 02-927 30th Nov 2020

TO WHOMSOEVER IT MAY CONCERN


This is to certify that M/s Nicco Engineering Services Limited, Chennai, had completed the contract for **In-situ Online floating of safety valves for** at CPCL, Manali Refinery as below:


1	Name of Work	Engaging an agency to In-situ online floating of safety valves of boilers / waste in CPCL, Manali Refinery.
2	Name of Agency	M/s. Nicco Engineering Services Pvt. Ltd, New No.63, Old No.31, Wallajah Road, Chennai - 600002
3	Work Order No & Date	25805767 dt: 30.01.2019
4	Value of Work Order	-/- (Excluding GST)
5	Actual value of Work Executed	-/- (Excluding GST)
6	Period of Contract	One (1) Year
7	Actual Start Date	30 th Jan 2019
8	Actual Date of Completion	29 th Jan 2020
9	Performance of the Work	Work was executed as per schedule and found satisfactory

This certificate is issued based on request from M/s. Nicco Engineering Services Pvt. Ltd, Vide their letter dated 24/11/2020.


S. Muthukumaraswamy
Chief Manager I/c (Inspection)

बॉटल नं 99012008, बॉटल नं 140012004, बॉटल नं 180012007, बॉटल नं 180012008, ISO 14001:2004, BS OHSAS 18001:2007 Certified company
बॉटल नं 40101 टी एन 1965 बॉटल नं 006388 / The CIN of the Company is L43101 TN 1665 GOC 006389
बॉटल नं / Manali, Chennai - 600 068, फोन / Phone : 2594 4000 to 09, वेबसाइट/Website : www.cpcl.co.in
पंजीकृत कार्यालय : 536, जंगल रोड, चेन्नई - 600 018 / Regd. Office : 536, Jangal Road, Chennai - 600 018. वेबसाइट/Website : www.cpcl.co.in

 **हिन्दुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड**
(भारत सरकार संश्लेषण) रजिस्टर्ड ऑफिस 17 जामशेडा टाटा रोड, मुम्बई - 400 020
HINDUSTAN PETROLEUM CORPORATION LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE) REGISTERED OFFICE: 17 JAMSHEDJI TATA ROAD, MUMBAI-400 020
CIN : L23201MH1952GOC008958




विभाग निर्यन्त्रण, पोस्ट बॉक्स नं. 15, विशाखापट्टणम - 530 011 (आंध्रप्रदेश), फोन : 2895000, 2895100
VISAKH REFINERY, POST BOX NO.15, VISAKHAPATNAM-530 011 (A.P.), PHONES : 2895000, 2895100

Date : 13th Sept 2019

TO WHOM SO EVER IT MAY CONCERN

This is to certify that M/s. NICCO ENGINEERING SERVICES LTD, Kolkata has successfully completed Online testing of safety valves connected to 9 nos IBR Boilers by their Valtest method vide our P.O. No. 18001411-OS-46002/LSA dated 26.03.19 during 15-16 April 2019 and 10th May 2019 at our Visakh Refinery.

The test reports along with test graphs were submitted for all the tested safety valves. IBR authority, Dy. Chief Inspector of Boilers, Visakh circle, Government of Andhra Pradesh witnessed the test & issued Form VI certificate on the basis of their test and test reports submitted.


M.V.N.S.S. SASTRY
Dy. General Manager-Inspection
HPCL-Visakh Refinery
P.B. No.: 15, Malkapuram,
VISAKHAPATNAM-530 011

Find More Performance Certificates on our Website:
<https://niccoengineering.com>

List of Clients

ACC



adani
Power



Network of Branches

Vadodara

653, Makarpura,
G.I.D.C.,
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CBD Belapur,
Navi Mumbai- 400 614
Phone: +91 22 4605 2862

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Poonithura P.O., Petta,
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Uttar Pradesh-201010.
Phone – 0120-2987295

Head Office: Kolkata

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CP-15, Sector-V,
Salt Lake City, 4th Floor,
Kolkata-700091
Ph: 033-6628-5000

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Chennai – 600002
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Thank You



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