



NUCLEAR & HYDRO-POWER



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www.MaArefTech.com



The **ONLY** PROFESSIONALIZED BOLTING COMPANY IN PAKISTAN



Exelon SM

Limerick Nuclear Power March '06

**OUTAGE TECH SUPPORT
PROVIDED BY:**

- HYTORC
- GENERAL ELECTRIC
- SIEMENS NUCLEAR



SIMULTANEOUS STRETCH TO LOAD

LOOSENING – 3 CLICKS OF THE REMOTE

20 SECONDS TO LOOSEN 2 CLAMPS

TIGHTENING - 100 % TO LOAD

40 SECONDS TO TIGHTEN 2 CLAMPS

In a recent maintenance shutdown at the Exelon Limerick Nuclear station in Pennsylvania, Clamps which had been in place for several years at over 260°C were removed in seconds and then re-used (again in seconds) when the turbine was re-assembled. Try that with a bolt heater!

**LOOSENING: 3 CLICKS OF THE REMOTE
20 SECONDS TO LOOSEN 2 CLAMPS**

**TIGHTENING: 100% TO LOAD
20 SECONDS TO TIGHTEN 2 CLAMPS**

SAFETY - QUALITY - SCHEDULE

The **ONLY** PROFESSIONALIZED BOLTING COMPANY IN PAKISTAN



HIGH PRESSURE TURBINE (84Bolts)

HYTORC BOLTING TIME INSTALL 72 MINUTES

HYTORC BOLTING TIME REMOVAL 34 MINUTES



LOW PRESSURE-INNER CASING (30Bolts)

HYTORC BOLTING TIME INSTALL 90 MINUTES

HYTORC BOLTING TIME REMOVAL 46 MINUTES



LOW PRESSURE- BLADE RINGS (82Bolts)

HYTORC BOLTING TIME INSTALL 16 MINUTES

HYTORC BOLTING TIME REMOVAL 10 MINUTES



LOW PRESSURE- POCKET BOLTS (4Bolts)

HYTORC BOLTING TIME INSTALL 12 MINUTES

HYTORC BOLTING TIME REMOVAL 8 MINUTES

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compliant**

LOOSENING: 3 CLICKS OF THE REMOTE
20 SECONDS TO LOOSEN 2 CLAMPS

TIGHTENING: 100% TO LOAD
20 SECONDS TO TIGHTEN 2 CLAMPS

SAFETY - QUALITY - SCHEDULE

The **ONLY** PROFESSIONALIZED BOLTING COMPANY IN PAKISTAN



THE TASK

**CUT 3 FULL DAYS OFF YOUR OUTAGE
AND REMOVE ALL FME CONCERNS**

THE CREW

**HYTORC SUPERVISION WITH
CONTRACTOR**

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LOOSENING: 3 CLICKS OF THE REMOTE
20 SECONDS TO LOOSEN 2 CLAMPS

TIGHTENING: 100% TO LOAD
20 SECONDS TO TIGHTEN 2 CLAMPS

SAFETY - QUALITY - SCHEDULE

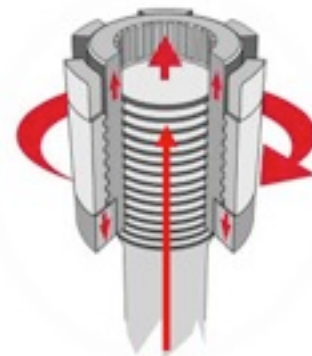
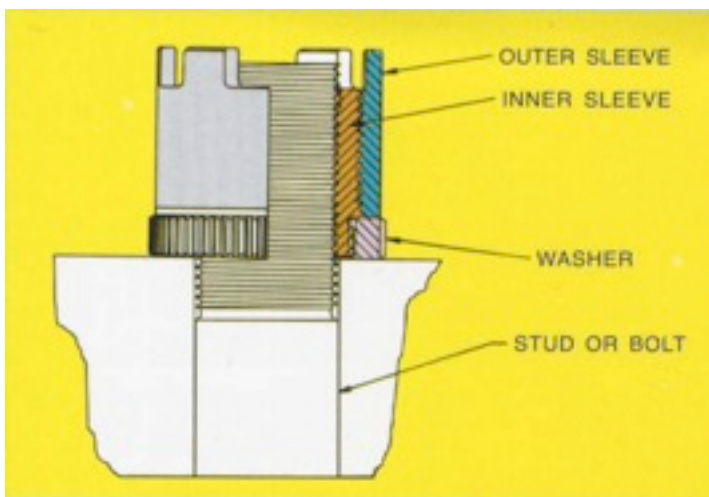
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POWER GENERATION

NUCLEAR



COLD STRETCH TO LOAD - WITH NO MEASUREMENTS



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LOOSENING: 3 CLICKS OF THE REMOTE
20 SECONDS TO LOOSEN 2 CLAMPS

TIGHTENING: 100% TO LOAD
20 SECONDS TO TIGHTEN 2 CLAMPS

SAFETY - QUALITY - SCHEDULE

The **ONLY** PROFESSIONALIZED BOLTING COMPANY IN PAKISTAN

JETTYD™
CORPORATION

BOLTING - OPTIMIZATION



1999	EXELON-LIMERICK	PA	3-LP 1-HP	2006	EXELON-DRESDEN	IL	1-LP U#2
2003	PPL-SUSQUEHANNA	PA	3-LP 1-HP U#2	2006	AEP-DC COOK	MI	3-LP
2004	PSE&G-SALEM	NJ	3-LP	2007	EXELON-DRESDEN	IL	1-LP U#1
2005	TU ELECT-COMANCHE	TX	2-LP	2008	EXELON-DRESDEN	IL	1-LP U#3
2006	PPL-SUSQUEHANNA	PA	3-LP 1-HP U#1	2008	EXELON-PEACH BTM	PA	3-LP
2006	EXELON-LIMERICK	PA	1-LP	2008	EXELON-DRESDEN- ALL STEAM VALVES		

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compliant**

JETTYD™
CORPORATION



(Method) Conventional Torque

Disassembly of two Turbines 43.5 hours
Assembly of two Turbines 34.2 hours

Disassembly one Turbine **21.75 hours**
Assembly one Turbine **17.12 hours**

(Method) In Service for 10 Years with Clamp-Nuts

Disassembly one Turbine **4.00 hours**
Assembly one Turbine **3.00 hours**

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SAFETY - QUALITY - SCHEDULE

JETYD™
CORPORATION



CONTROL VALVES

CLAMP NUT/COLD STRETCH
2-PASSES- NO MEASURING

(16) 2-3/4"-8 BOLTS

NEW METHOD: 35 MINUTES

OLD METHOD: 4 HOURS 30 MIN

STEAM VALVES

- MAIN STEAM SAFETY VALVES - 50 MINUTES
- TURBINE BYPASS VALVES - 25 MINUTES
- ISOLATION VALVES - 58 MINUTES

**HANDS-FREE
OPERATION**

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SAFETY - QUALITY - SCHEDULE

HYTORC
Since 1968

JETTYD
CORPORATION



LP-INNER-CASING BOLTS
(42) 4-3/4"-8 BOLTS
NEW METHOD: 2 HOURS
OLD METHOD: 10 HOURS

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COMPLIANT

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SAFETY - QUALITY - SCHEDULE

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CORPORATION



LP-GUIDE BLADE CARRIERS

(16) 2-3/4"-8 BOLTS

NEW METHOD: 30 MINUTES

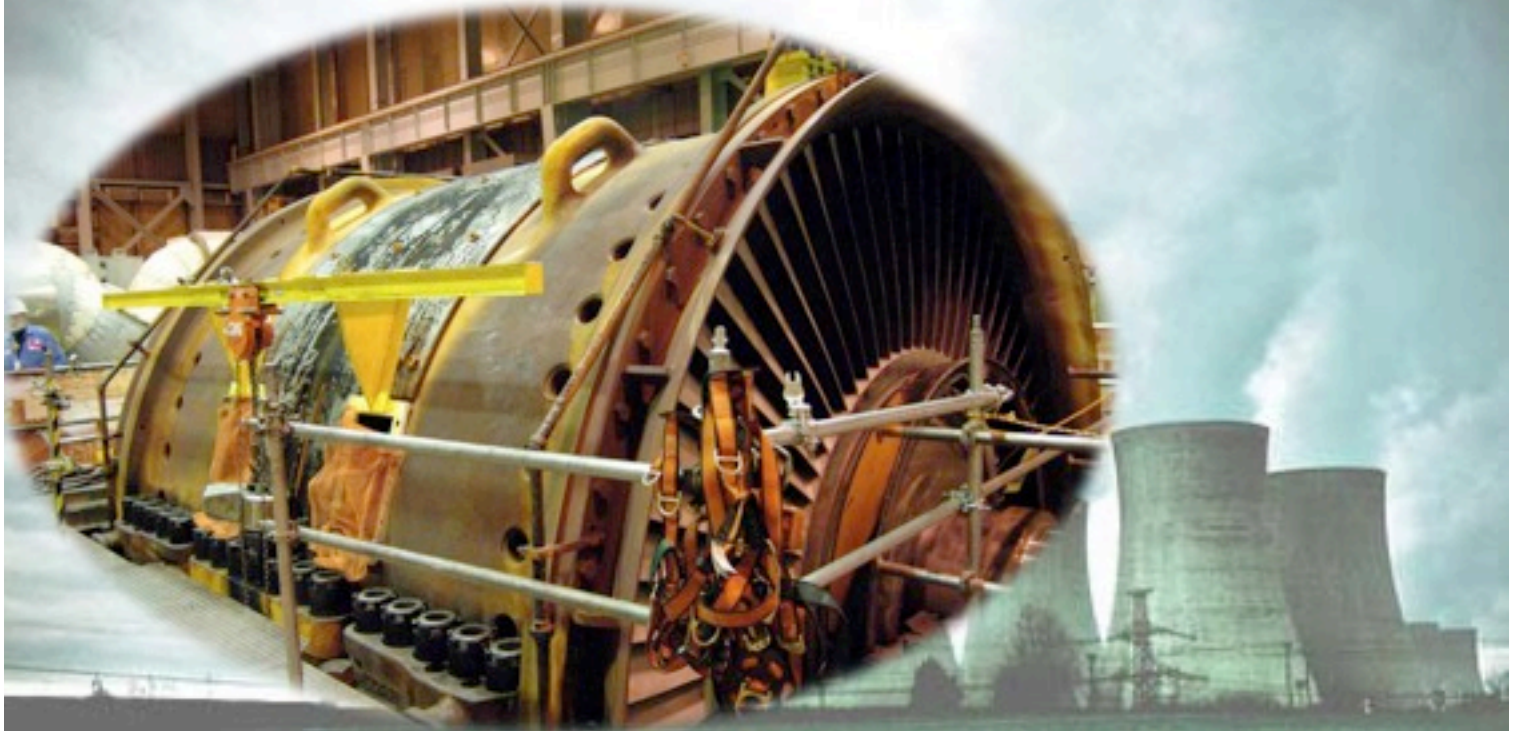
OLD METHOD: 6 HOURS

**ZERO
PINCH-POINTS**

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SAFETY - QUALITY - SCHEDULE

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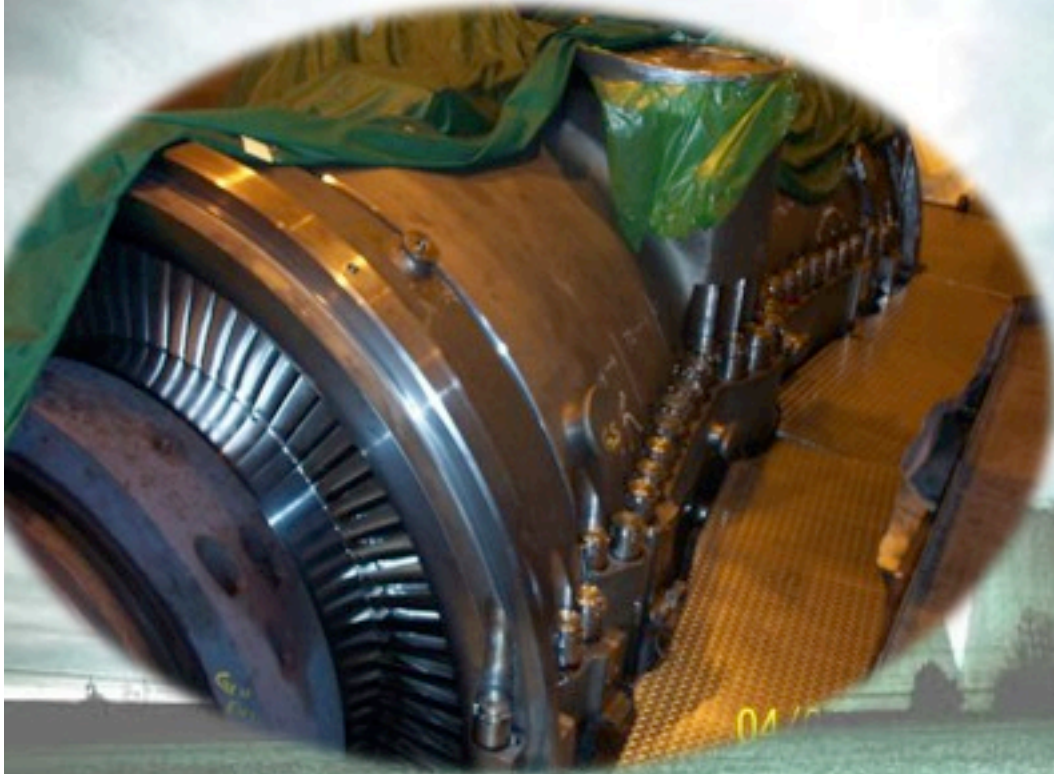
COMPLETE -LP TURBINE
(82) INTERNAL/EXTERNAL BOLTS
NEW METHOD: 3 HOURS
OLD METHOD: 21 HOURS 50 MINUTES

**HUMAN
PERFORMANCE
BOOSTER**

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compliant**

COMPLETE -LP TURBINE
(82) INTERNAL/EXTERNAL BOLTS
NEW METHOD: 3 HOURS
OLD METHOD: 21 HOURS 50 MINUTES

SAFETY - QUALITY - SCHEDULE



COMPLETE -HP TURBINE

(52) INTERNAL BOLTS

NEW METHOD: 2 HOURS 30 MINUTES

OLD METHOD: 28 HOURS 10 MINUTES

**ZERO
MEASURING**

COMPLETE -HP TURBINE

(52) INTERNAL BOLTS

NEW METHOD: 2 HOURS 30 MINUTES

OLD METHOD: 28 HOURS 10 MINUTES

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SAFETY - QUALITY - SCHEDULE

JETYD™
CORPORATION



FEEDWATER - HEATERS
(20) 1-5/8" BODY BOUND BOLTS
NEW METHOD: 45 MINUTES
OLD METHOD: 2 HOURS 35 MINUTES

**JETYD
LOADISC
HANDS-FREE**

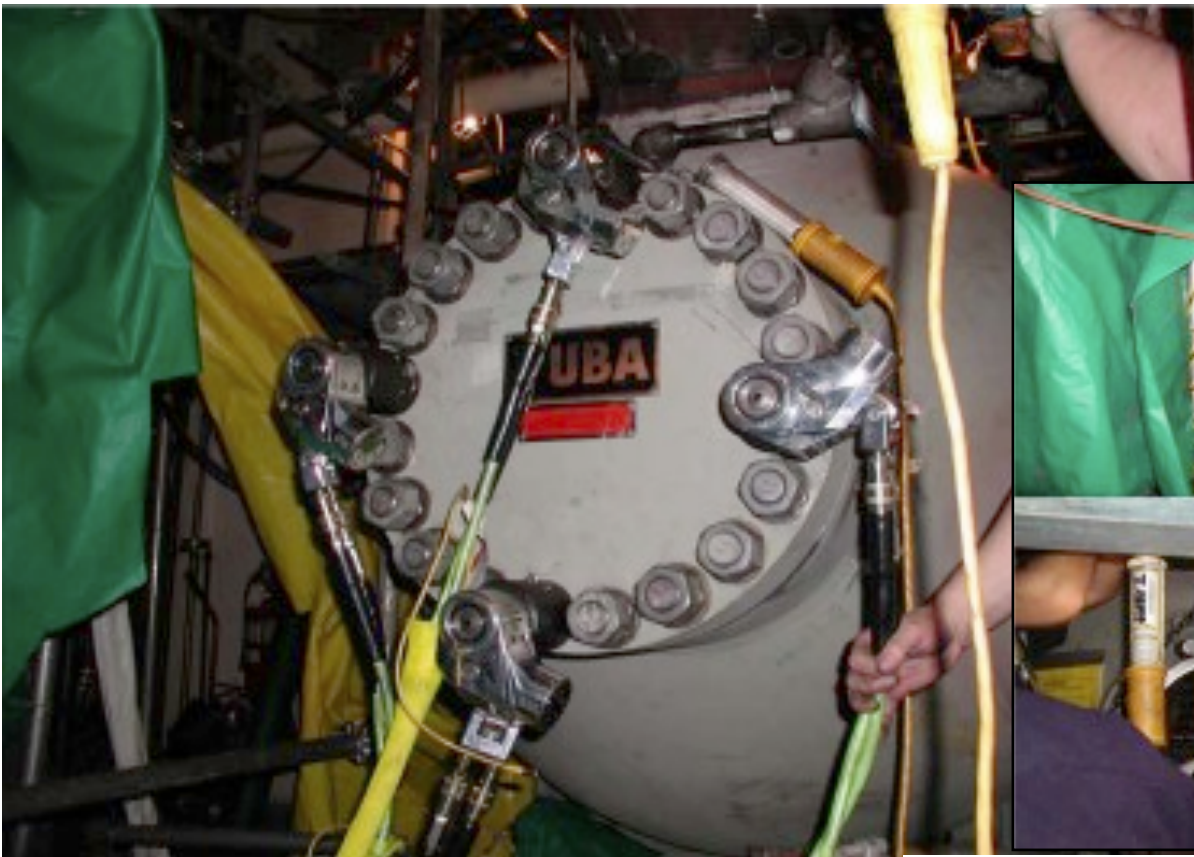
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SAFETY - QUALITY - SCHEDULE

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VERMONT YANKEE NUCLEAR BWR

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Description of Application

Feed Water Heaters-Manway Covers
4 of Avanti-3 with 1-5/8-8 Disc Washers-
Pump QAS-115

20 Bolt Flanges-with Gasket
50% - 100% at 70% Yield

Benefit To Customer

Time Savings-Safety in Hot area
Paid for itself on first Flange
Procedure shortened-Less Passes
Main reason for purchase of system
Parallel joint Closure-Instantly!

Past Problems

- *Bolt Gauling in Blind Casing
- *Reaction Issues in Confined Areas
- *Nut Surface Gauling-Loss of Load



Vermont Yankee Nuclear BWR
Brattleboro-Vermont
2004 Refuel-Outage
Now Loaded up with Disc Washers

Yuba Heat Transfer



Highest degree of accuracy to date for their manufacturing plant.



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Yuba is a manufacture of industrial heat transfer units (boilers). Rocky has been able to sell clamp nuts to help close these units without leaks. They have many more of these units to be built coming soon. Rocky will keep us up to date.

Hydro-Turbine Parts

Company Name:
Philadelphia Gear

Decision Makers:
Shop Foreman

Called HYTORC & Competitor
to see who could solve the
quickest.

Gear Box Repair

Stealth-4 Special Hex Adaptor
with reaction Post & Hydraulic
Pump sold.

Hydro-Turbine Gear Box Quote
Challenge- 1" Allen Bolts Over Torqued 2700 Ft-Lb
Installed with Lock-Tite
Solution: Stealth-4 with Special Hex Adaptors



SAFETY - QUALITY - SCHEDULE

NUCLEAR INSTALLATIONS



AEP

**DC COOK NUCLEAR
FEEDWATER
VALVES**

**BONNET VALVES
MANWAY COVERS**



TURBINE-CLAMP®

**fme
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SAFETY - QUALITY - SCHEDULE

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NUCLEAR INSTALLATIONS



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**ENTERGY
VERMONT YANKEE

HPCI- VALVES
FEEDWATER
HEATER
MANWAY COVERS**

SAFETY - QUALITY - SCHEDULE

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NUCLEAR INSTALLATIONS



TURBINE-CLAMP®

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**KANSAS
ELECTRIC
WOLF CREEK
MSIV-VALVES**

SAFETY - QUALITY - SCHEDULE

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NUCLEAR INSTALLATIONS



PENN POWER
SUSQUEHANA
UNITS 1 & 2

2-HP TURBINES
6-LP TURBINES

EXCELON
LIMERICK NUCLEAR

1- HP TURBINE
3- LP TURBINES



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TURBINE-CLAMP®

SAFETY - QUALITY - SCHEDULE

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NUCLEAR INSTALLATIONS



PSE&G
SALEM NUCLEAR
3- LP TURBINES



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TURBINE-CLAMP®

SAFETY - QUALITY - SCHEDULE

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NUCLEAR INSTALLATIONS



**TU ELECTRIC
COMANCHE PEAK**

3- LP TURBINES

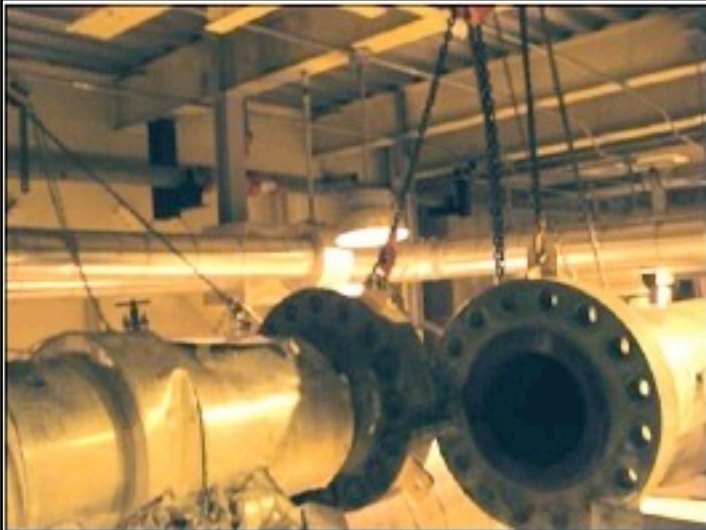


TURBINE-CLAMP®

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SAFETY - QUALITY - SCHEDULE

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STEALTH-14 with SRP & AF 115mm links
Qty x2 SIMULTORC & a Twin pump.

Application – Ventura flange

LEAKAGE-ZERO!



STEALTH®

SAFETY - QUALITY - SCHEDULE

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