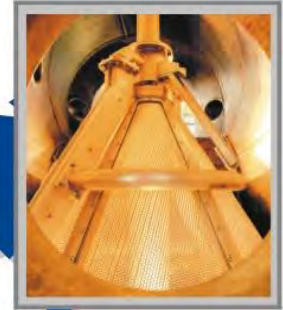




# GEA-BGR



*Progress Through Technology*

# PRODUCT



MSF DESALINATION  
PLANTS



THERMAL  
POWER STATIONS



TUBE CLEANING SYSTEM

AUTOMATIC DEBRIS FILTER

CLEANING BALLS

NUCLEAR  
POWER STATIONS



PROCESS  
INDUSTRIES



COMBINED CYCLE POWER STATIONS





# CORPORATE PROFILE

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- ❑ 1985 JV with GEA GmbH (60 : 40)
  - ❑ 1988 GEA India manufacturing Plant established  
Exclusive global facility for Tube Cleaning System & Debris Filter
  - ❑ 1989 Design, Manufacture, Quality Center & After Sales Service commence
-

Corrosion and fouling of Condenser & Heat Exchanger Tubes are major factors affecting the performance of a plant.

Fouled Condition



Barrier for heat transfer



Cleaned Tubes



Saves Energy-Improves Efficiency

On Load Tube Cleaning System facilitates continuous cleaning of the Condenser Tubes up with the Plant in operation. Cleaning is accomplished by passing slightly oversized Sponge Rubber Balls through the condenser tubes.

## Major Components and Auxillary Equipment

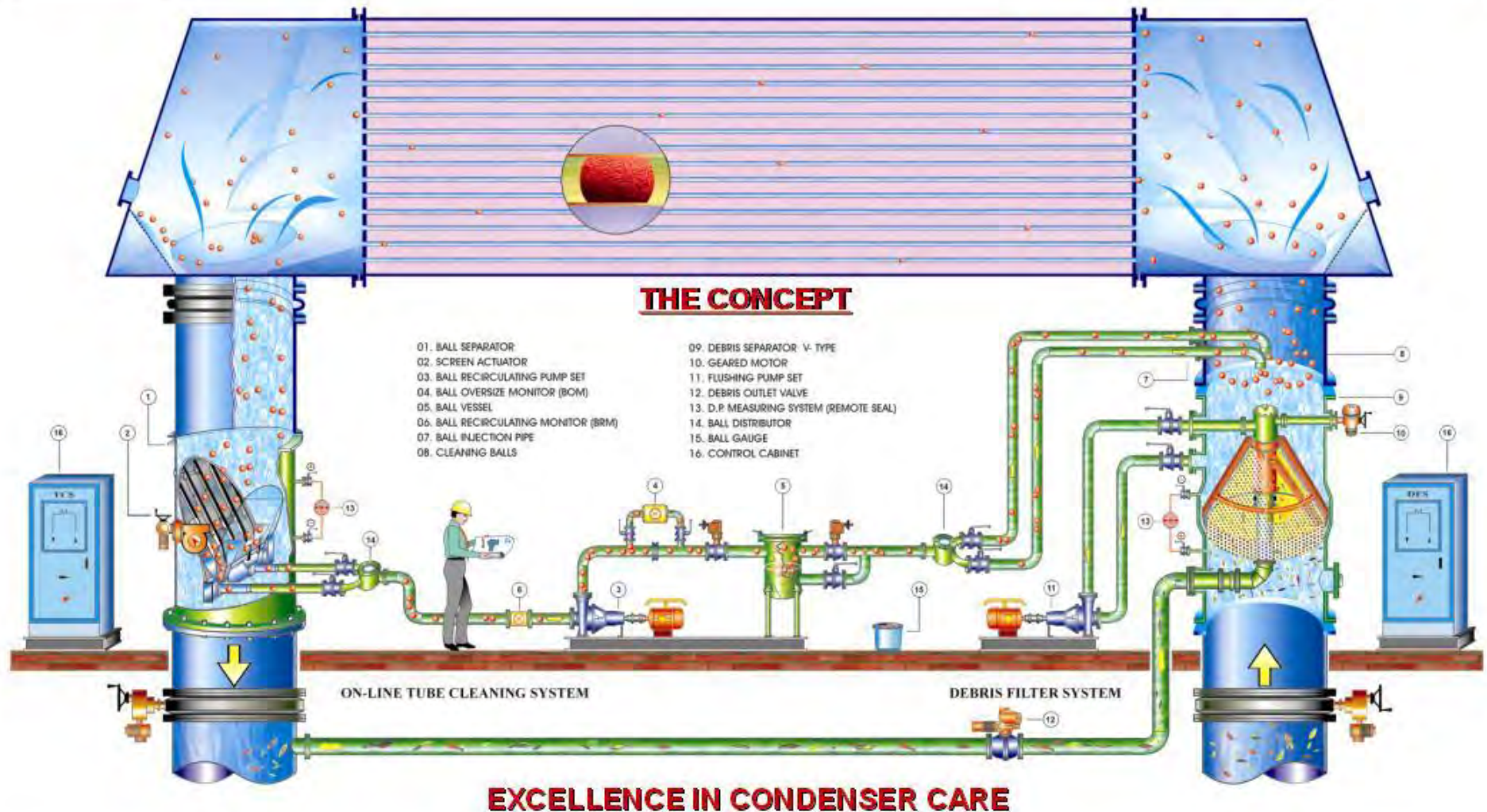
Ball Separator or Strainer

Ball Recirculating Skid

Control System



# GEA INDIA CONDENSER ON-LINE TUBE CLEANING SYSTEM & DEBRIS FILTER



## BALL SEPARATOR



The Ball Separator installed in the C.W. Outlet separates the Cleaning Balls which are then pumped back into the C.W. Inlet

### Special Feature:

- Individual drives for each screen
- High Ball Collection efficiency

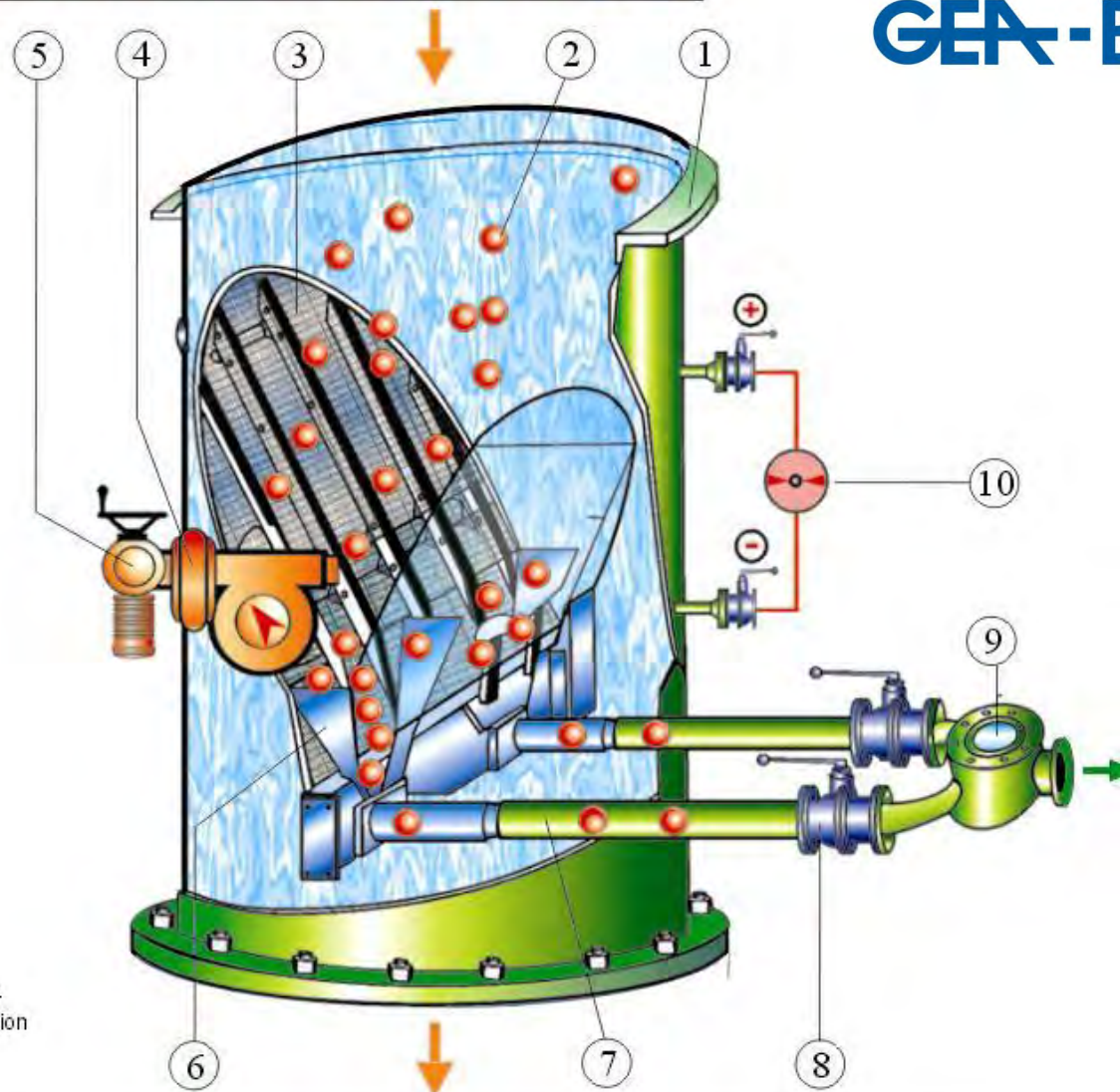
### Various sizes & specifications:

Line size	DN 200 (8 in.) to DN 3600 (142 in.) dia.
Flow rates	500 M <sup>3</sup> /Hr. (2201 gpm) To 110000 M <sup>3</sup> /Hr. (484315 gpm)
<u>Materials</u>	
<u>Shell</u>	Carbon Steel, Stainless Steel, Cupro Nickel
<u>Internals</u>	SS 316 Ti, SS 317 LN, Cupro Nickel
Design Standards	ASME / DIN / BS / BIS / JIS







# GENERAL ARRANGEMENT OF BALL SEPARATOR



PNO	DESCRIPTION
1	SHELL
2	SPONGE CLEANING BALLS
3	SCREEN
4	WORM GEAR BOX
5	SCREEN ACTUATOR
6	EXTRACTION ARM
7	EXTRACTION PIPE
8	ISOLATION VALVE
9	V - PIECE
10	DP MEASURING SYSTEM

 Main C.W. Flow.  
 Ball Transportation



The Ball Recirculating Skid is a composite unit with a Ball Recirculating , Ball Vessel and the Inlet and Outlet Valves mounted on it.

### Special Features:

- A special pump to circulate the balls without any damage into the cooling water inlet.
- A ball vessel with electrically operated ball valves to facilitate automatic ball charging and collection - hence totally maintenance free.
- Ball Monitoring & Automatic Sorting System to reduce operator interface (optional feature).





## CONTROL SYSTEM (SKID MOUNTED)



### OPERATION

- ◆ AUTOMATIC
- ◆ MANUAL

### INITIATION

- ◆ LOCAL
- ◆ REMOTE. (DCS)

### INDICATION

- ◆ PROCESS MIMIC WITH INDICATION
- ◆ AUDIO/ VISUAL ALARMS FOR FAULT DIAGNOSIS

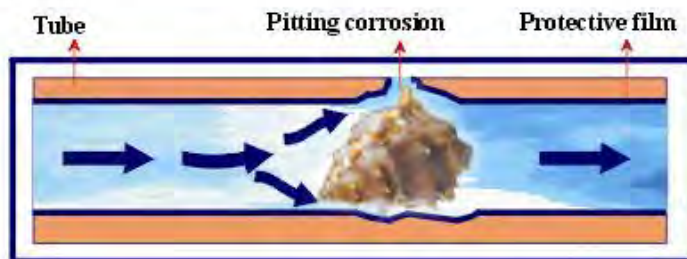
### CONTROL SYSTEM

- ◆ CHOICE OF RELAY OR PLC BASED SYSTEMS WITH OR WITHOUT REDUNDANCY



## DEBRIS FILTER

Debris such as shells, sticks, stones, and plastics are the common cause of fouling of condenser and heat exchanger tubes. A screening system located as close as possible to condenser water box is now regarded as essential.



**"V"-TYPE DEBRIS FILTER**

GEA India offers Automatic Debris Separators in a wide range of sizes which fulfil these requirements.





The V-Type Debris Separator is designed to be used as a secondary filtering systems in conjunction with travelling band screens.

## Design Features

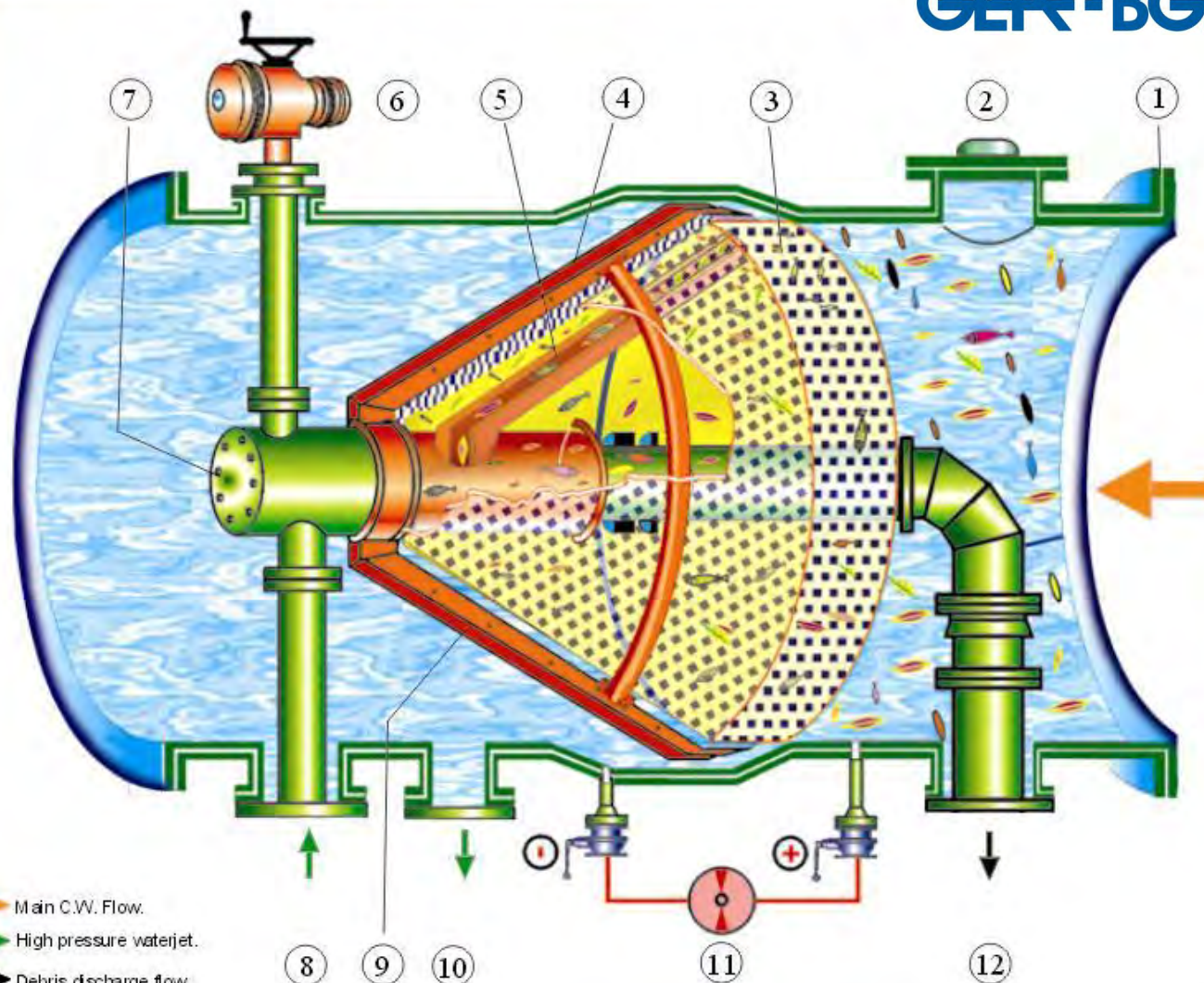
- ✧ Filter basket perforations range from 1 to 10 mm.
- ✧ Normal flushing cycle of 1-3 minutes.
- ✧ Sticky debris, requires an additional facility for effective removal. A high pressure water spray arrangement is provided on the outside of the screen basket for “jet washing”. This is a special feature of GEA design.
- ✧ Low Back wash flow.

## Various sizes and specifications

Line size	DN 200 (8 in.) to DN 2800 (110 in.)
Flow rates	400 m <sup>3</sup> /Hr. (1761 gpm) To 65000 m <sup>3</sup> /Hr. (286186 gpm)
<u>Materials</u>	
<u>Shell</u>	Carbon Steel, Stainless Steel, Cupro Nickel
<u>Internals</u>	SS 316 Ti, SS 317 LN, Cupro Nickel
Design Standards	ASME / DIN / BS / BIS / JIS
Installation position	Vertical / Horizontal.



# GENERAL ARRANGEMENT OF DEBRIS FILTER



PNO	DESCRIPTION
1	SHELL
2	MAN HOLE
3	SCREEN BASKET
4	INJECTION ARM
5	DEBRIS EXTRACTION
6	GEARED MOTOR
7	GEAR BOX
8	FLUSHING WATER INLET
9	FLOW EQUALIZER
10	FLUSHING WATER OUTLET
11	DP MEASURING SYSTEM
12	DEBRIS DISCHARGE





A dedicated facility located in Germany to manufacture the complete range of Cleaning Balls including high temperature balls for Desalination Plants. The plant is equipped to manufacture about 6 million balls per annum.

### Types

**Sponge Rubber** - Hardness selected to suit service conditions

**High Temperature Balls** - For application upto 140° C (280° F) - Desalination MSF Plants.

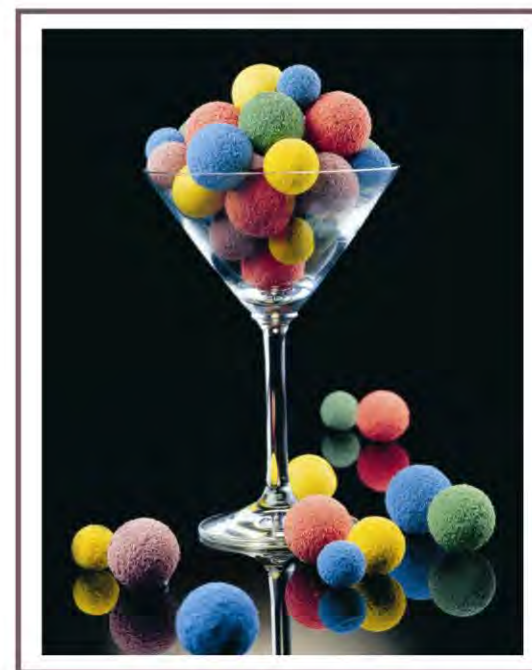
**Abrasive Balls** - Ring/ Fully coated for removal of hard deposits.

**Granulate Coated Balls** - For use in Titanium & Stainless Steel Tubes.

### Application and Range:

temp. upto 80° C ( 176° F)

temp. upto 140° C ( 284° F)



## **MANUFACTURING FACILITY**



**Located about 50 kms (31 miles) from Chennai (India).**

**Production capacity of 250 systems per year.**

**Wholly owned subsidiary - M/s. Schmitz GmbH, Germany for manufacturing the complete range of sponge cleaning balls.**

**Approved by the following Quality Surveillance agencies.**

**Germanischer Lloyds, Hamburg.**

**Lloyds Register of Industrial Services**



**PRODUCTION CENTRE-ISO 9001**



# Our Customers

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SIEMENS



HYUNDAI  
HEAVY INDUSTRIES CO., LTD.

Singapore



Public Utilities Board

TOSHIBA



Electricity Authority of Cyprus



DUKE/FLUOR DANIEL™



ALSTOM



AnsaldoEnergia

## WHY GEA INDIA ?

- World class proven Technology
- 1000 Installations Worldwide
- Expertise in handling specialized material
- System components from the world's best brands



## **WHY GEA INDIA ?**

- Backed by sound R & D and over 300 professionals for this product
- In-House manufacturing & testing, ensuring superior workmanship
- Production facility for Cleaning Balls
- ISO 9001 Accredited Facility

## **ALSTOM - ANP HAYS CCPP**



☐ **System** : Control Panel

☐ **Size** : DN 500

☐ **Feature** : Containerised  
Outdoor  
installation



## JEBEL ALI "G" PLANT - DUBAI



- ❑ **System** : TCS - Ball Strainer
- ❑ **Size** : DN 1600
- ❑ **Feature** : Special Material of Construction (Cu-Ni 90:10) suitable for highly corrosive environment

## FOSTER WHEELER – USA



- ☐ **System** : TCS
- ☐ **Size** : DN 3500
- ☐ **Feature** : Biggest Size.  
Unique screen design.



## ALSTOM – LUNGMEN NUCLEAR



☐ **System** : Debris Filter

☐ **Size** : DN 2700

☐ **Feature** : Low DP

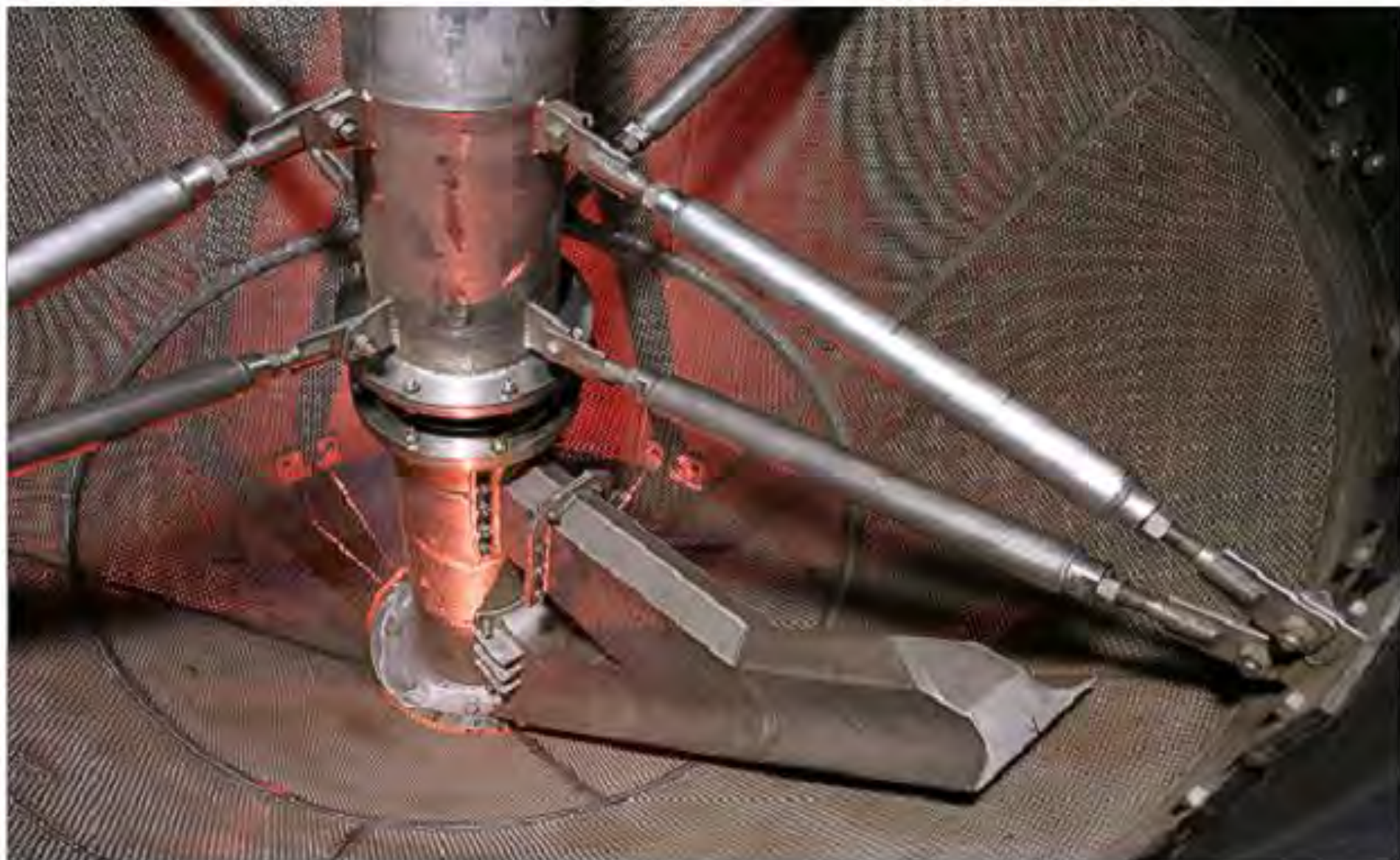
## **AMER - TAICHUNG TPP**



- ☐ **System** : Debris Filter
- ☐ **Size** : DN 500
- ☐ **Feature** : Low DP, Pipe Elbow



## DEBRIS EXTRACTION - NEW





# AUTO BALL SORTER





# R & D TEST LOOP FACILITY



Inhouse R&D "Test Loop" Facility