NEW METHODS TO PROVIDE AND CONTROL CLEANLINESS OF POWER PLANTS INNER CAVITIES

JOINT STOCK CORPORATION
SHIPBUILDING & SHIPREPAIR
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PORTABLE STAND PURPOSED FOR FLUSHING, WATER TREATING AND TESTING OF COLD WATER SYSTEMS

Cleanliness of inner cavities of articles and systems during manufacturing, testing, assembly and repair is one of the most important factors for long and safe operation of ship nuclear power plants (SNPP).

Final stage of inner cavities purification upon assembly completion is hydrodynamic flushing in closed circuit. Flushing procedure intensification increases its reliability, decreases operational duration and consumption of material/technical resources.

Intensification of flushing procedure allows increasing reliability and decreasing operation time of the same, saving at the same time material and technical resources.

SSTC is currently developing new equipment for flushing procedure intensification.

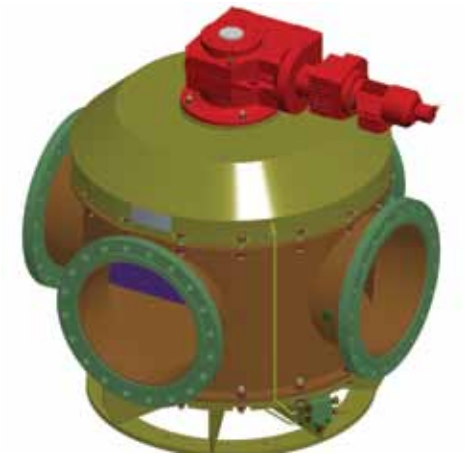
SPECIFICATIONS

Flushing water consumption, m^3/hour	up to 450
Pressure, kgf/cm^2	up to 12.5
Dimensions, m	7 x 3 x 4
Dry weight, ton	19
Power consumption, kW	up to 510
Test pressure, MPa	up to 12
Water consumption on water treating filters, m^3/hour	15
Operation mode	manual, semiautomatic
Filtration degree, micron	50

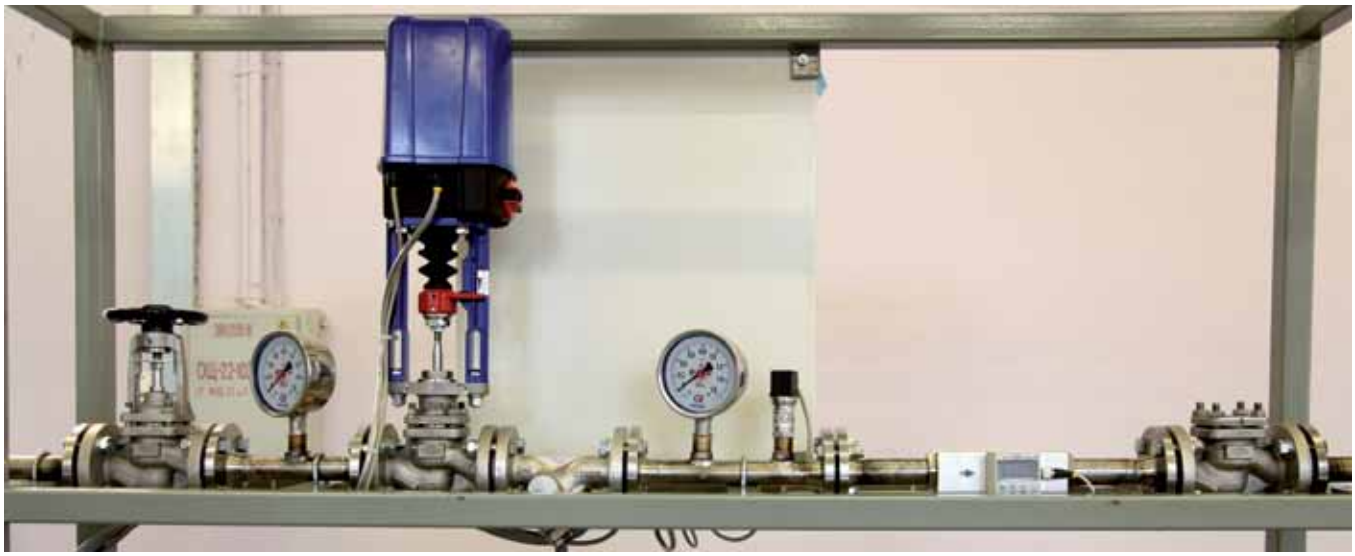
Flushing direction changing unit provides accelerated change of circulation direction to intensify articles flushing.

SPECIFICATIONS
OF FLUSHING DIRECTION CHANGING UNIT

Flushing water consumption, m^3/hour	up to 2000
Weight, ton	2.9
Input (output) flanges, DN	450
Minimum direction change rate (two reverses), min	to 1
Maximum working pressure during flushing, MPa	from 1.26
Dimensions, m	1.3 x 1.43 x 1.4



Bubbling unit provides application of compressed air together with flushing water for intensified pipelines flushing.



Mounts for pulsation and barbotage of flushing water are additional equipments for flushing stands, strictly required when manufacturing complicated marine engineering articles, assembly of systems, and can be used as well when flushing installed systems with standard pumps.

In accordance with results of pulsation mount trials, average acceleration of decontamination rate equals to:

- on initial stage of flushing — 2 times;
- on final stage of flushing — 3.5 times.

In accordance with results of barbotage mount trials, increase of acceleration decontamination rate equals to:

- on initial stage of flushing — by 17–37%;
- on final stage of flushing — up to 3–5 times.

It was estimated, that flushing water and power consumption of barbotage mount can be reduced down to 50%.

BUBBLING UNIT SPECIFICATIONS
(W/O COMPRESSOR AND RECEIVER)

Maximum flushing water consumption, m^3/hour	up to 200
Pneumatic module weight, tons	0.1
Pipeline maximum diameter, DN	not more than 150
Maximum working pressure, kfg/cm^2	not more than 8
Dimensions, m	1.9 x 0.5 x 1.9

In current shipbuilding practice, when manufacturing, repairing and installing marine nuclear power plants, content of mechanical impurities in flushing water is checked on dismounted filter by visual inspection of impurities quantity and by comparing the same with approved reference; in some cases no particles are observed visually. Chemical ratings are determined in laboratory, basing on investigation of flushing media samples.

SSTC and partner companies jointly work in the area of automation of flushing water contamination control performed in real-time mode by chemical and mechanical properties.

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