Indian Standard

SPHERICAL VALVES FOR HYDROPOWER STATIONS AND SYSTEMS

PART 2 SELECTION OF CONTROL EQUIPMENT

(First Revision)

1 SCOPE

1.1 This standard (Part 2) gives guidelines for the design and selection of the control equipment used in spherical valves.

FOREWORD

This Indian Standard (Part 2) (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Hydraulic Gates and Valves Sectional Committee had been approved by the River Valley Projects Division Council.

Spherical valve is a shut-off device most commonly used in hydropower stations for a head 200 m and above. These valves may be used at lower heads also. Its use is favoured at high heads as there is no hydraulic loss due to valve itself when valve is open and provides a better tight sealing when valve is closed.

It serves the following purposes:

a) Stops the water entry to the turbine when the later is stopped to decrease the water leakages. and to protect the guide vanes against slit cavitation and slit erosion;
b) Stops the water entry in case of emergency, that is, non-closure of guide apparatus or in the event of low oil pressure in the system;
c) Unit isolation in multi-unit plants where one penstock feeds more than one unit; and
d) To facilitate inspection of water path passages.

Basically spherical valve consists of spherical valve, air valve and water/oil pressure system or any other control system which is required for operation of spherical valves.

This standard covers only the guidelines (criteria) for structural and hydraulic design of valves so as to permit necessary flexibility in their detailed design as per requirements of the designer.

These guidelines are based on the available expertise and the practices prevailing in this field at present so that the same could be utilized. As and when some more information is available the same will be incorporated in the standard. Therefore, these are expected to be used by those designers who have sufficient knowledge in this field.

This standard is being published in three parts. Part 1 deals with structural and hydraulic aspects of design. This standard (Part 2) deals with the guidelines for the design and selection of the control equipment used in spherical valve. Part 3 deals with the operation and maintenance of spherical valves.

This standard (Part 2) was first published in 1974. This revision has been taken in hand so as to up date its provisions based on the experience of the users in the past years and to keep in line with its basic standard, that is, Part 1.

For the purpose of deciding whether a particular requirement of this ‘standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding of numerical values (*revised*)’. The number of significant places retained in the rounded of value should be the same as that of the specified value in this standard.