



PRODUCT DESCRIPTION

CARGO BALLASTING SYSTEM



Product Definition

Inrada Oil & Gas Cargo Ballasting Systems are used to ensure that the ballast in the hull of a floating production platform (FPSO) is distributed evenly so that the facility is always in balance. We provide the controls, valves and actuators as part of a complete control and safeguarding package.

Product Description

A complete cargo ballasting system consists of two parts: cargo pumps, which transfer cargo fluids such as crude oil and oil products from the storage tanks to the discharge; and ballast pumps, which transfer seawater to the ballast tanks and vice versa. To ensure this process is controlled in a safe manner, a large number of (submersed) valves and actuators ensure a correct flow of fluids and a properly balanced production platform.

Inrada Oil & Gas solutions typically consist of the following equipment:

- Hydraulic power unit
- Control panel
- Process control valves
- Actuators
- Emergency manual pump unit
- Interface engineering



Process Description

Due to the nature of a floating production platform, a cargo ballasting system needs to be located over the entire area of the hull. This requires a specially designed hydraulic system, with particular attention to tubing sizes and lengths, as well as the optimal layout, location and installation of the control panels.



Inrada Oil & Gas systems include a hydraulic power unit which drives the actuated valves. The power units have a standard industrial design that can be installed in a safe area or engineered according to client specifications for installation in a zone 1 or zone 2 area. The hydraulic pump controls and starters are incorporated in the package to provide a plug & play solution.

Controlled opening of the actuated valves is managed by means of a control panel equipped with solenoid valves for each actuated valve. These solenoid valves are 4/3-way or 3/2-way,

depending on the type of actuator (double-acting or spring return).

Valve positioning ensures that the cargo ballasting system knows that subject control valves are in open or closed position. To accommodate this feature, we can provide two options. The first option consists of direct feedback signaling that can be installed at the actuated valve mounted to the stem. As a second option, we can install a volumetric position indicator with transmitter feedback, which determines the position of the actuated valve according to the displaced volume of the actuator.

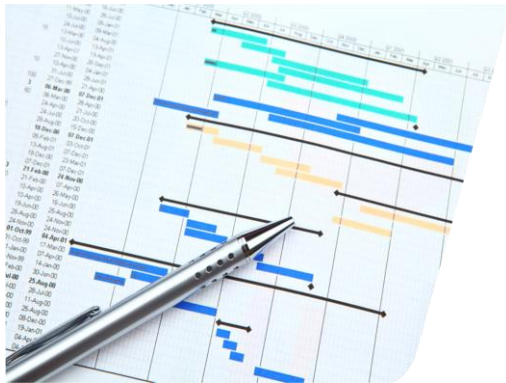
Depending on the optimum deck layout and location of the controls, we can opt for a shared centralized control panel or decentralized multiple control panels, which are located near a group of actuated valves. This reduces the number of interface lines from control panel to actuator.

Local control panels and their instrumentation can be designed to operate in a zone 1 or zone 2 area, depending on the final location.

Inrada designs and assembles its systems in close consultation with its clients, resulting in solutions that adequately meet our clients' needs. We are specialized in the selection of actuated valves from a range of reliable suppliers, which enables us to provide complete, customized systems. We take full responsibility for the layout, selection, interfacing and functional requirements of the cargo valve ballast control system, and provide an optimized integrated solution that is fully tested and ready for on-board installation.

Project Management

At Inrada, we understand that success depends on sharp project management. As our client, we are driven to support your business, with our dedicated project team always on hand for one-on-one contact, providing you with the best possible service.



From concept through to design, production, testing and delivery, our project team will know your operating environment, and will use the latest technology to precisely meet your needs. We are solution-oriented, understand your industry and always use strict document control and professional planning to exercise tight process control and meet all delivery deadlines.

Our global office network, international supply chain and partnerships with leading vendors mean we are always able to supply the best possible systems and meet all of the local requirements and regulations.

Technical Details

- Design pressures : Typically up to 5000 psi
- Motor power : Typically around 22 kW
- Fluid : Mineral hydraulic oil
- Area : Safe area, zone 1 or zone 2
- Wetted parts : Carbon steel, AISI 316

Added Value Inrada

- Customized design according client requirements and project conditions.
- In-house engineering team that designs powerful hydraulic packages with limited plot space
- Compact, modular design
- Interface engineering
- Total system responsibility
- Installation and commissioning
- Third-party design appraisals
- 24/7 worldwide service and after-sales support

References

- FPSO Cidade de Paraty – Petrobras
- FPSO Cidade de ILHABALA – Petrobras
- FPSO P66-P73– Ecovix-Petrobras
- FPSO Stones - Shell



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