

FLEXIBLE CONNECTION BETWEEN SUSPENDED DECK AND CONTAINMENT SYSTEM FOR MEMBRANE ONSHORE TANKS

Disclosed by Gaztransport & Technigaz

Research Disclosure database number 618023

Published in the October 2015 paper journal

Published digitally 08 September 2015 09:32 UT

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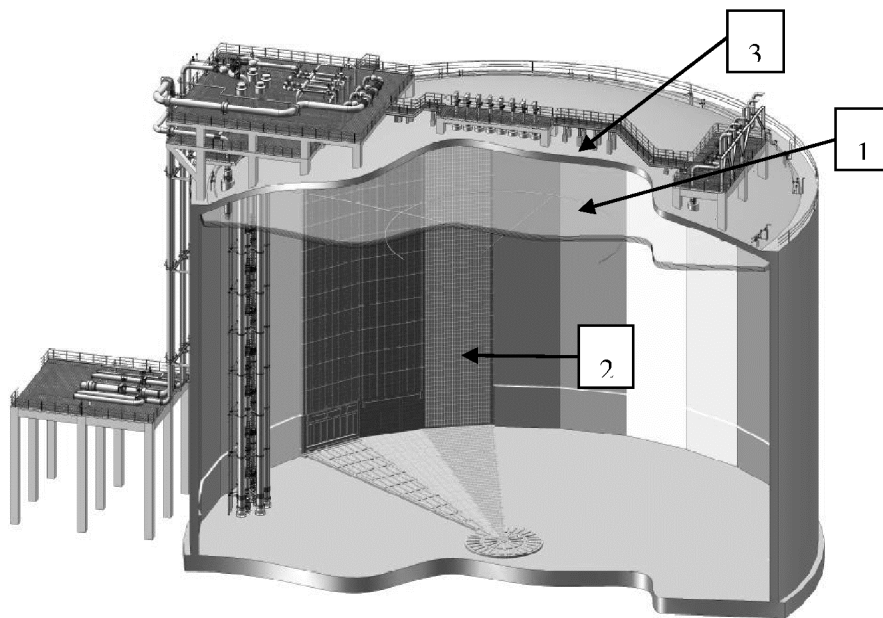
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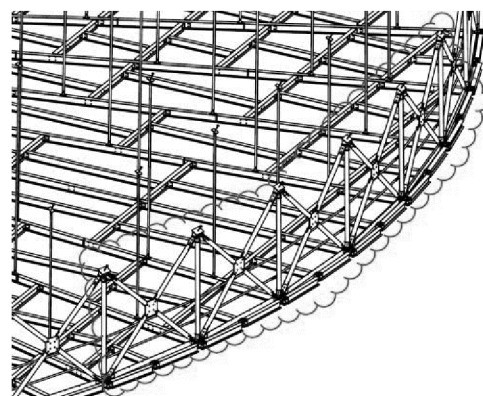
FLEXIBLE CONNECTION BETWEEN SUSPENDED DECK AND CONTAINMENT SYSTEM FOR MEMBRANE ONSHORE TANKS

By: Jérôme Pellé, Cécile Cohé and Erwan Michaut

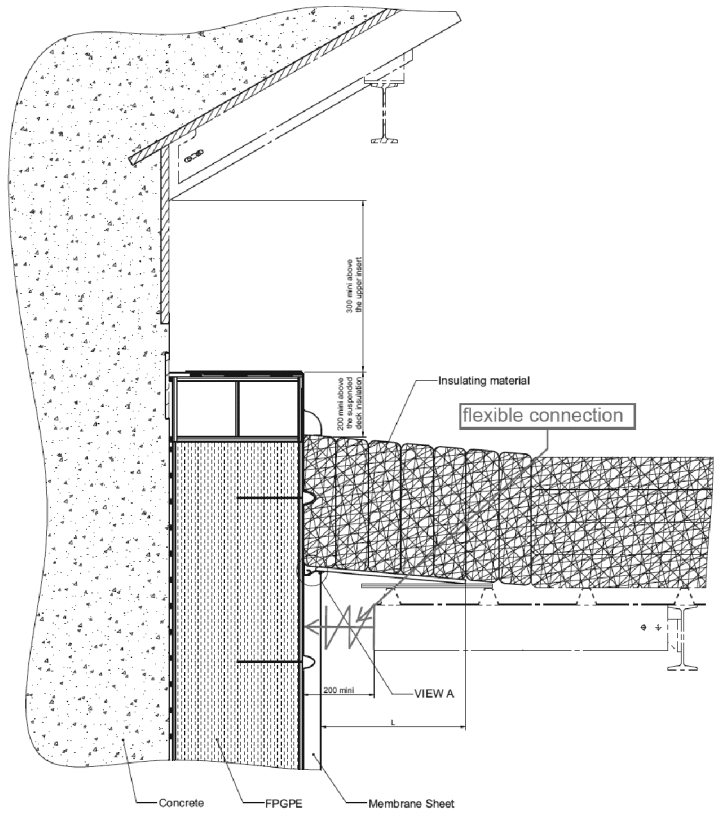
In cryogenic onshore tanks, an insulated suspended deck (1) is installed at the upper part of the primary container (2). This suspended deck is made of an aluminum structure covered with an insulating component, usually glass wool or fiberglass blankets used to control the Boil Off Rate of the tank and keep the dome roof (3) at an acceptable temperature.



For geographic areas where the geotechnical data lead a significant movement of the suspended ceiling during a seismic event, the conventional designs imply the installation of a specific reinforcement on the structure periphery. This reinforcement is made of a beams network used to stiffen the structure and limit its displacements. The objective is to avoid a violent impact between the rigid structure and the metallic membrane with a risk of damaging the integrity of the primary membrane.



The purpose of the solution consists in installing a flexible connection (ensured by an appropriate element) between the suspended deck and the containment system with the objective to significantly simplify the suspended ceiling structure.



Thanks to this device, in case of displacement of the structure led by a seismic event, this one will enter into contact with the containment system with a limited force. The energy resulting from this displacement is absorbed by this shock absorber. The system is installed all around the periphery of the structure and is sized according the energy which has to be dissipated. Installed just above the liquid level, the material shall be able to ensure its function in cryogenic condition.

The system could be made by different solutions; one of them consists of a pad made of plywood bonded on a foam block (similar to Top Bridge Pad). The plywood is screwed on the ceiling structure and the foam is oriented toward the primary membrane. The foam density and the size of the pad are defined according to the project specificities. If necessary, flexible pieces, such as elastic joints or spring washers can be added to reach the requested flexibility. Alternative solution could be found by using for the pad, a material with thermal and mechanical properties allowing absorbing shock.