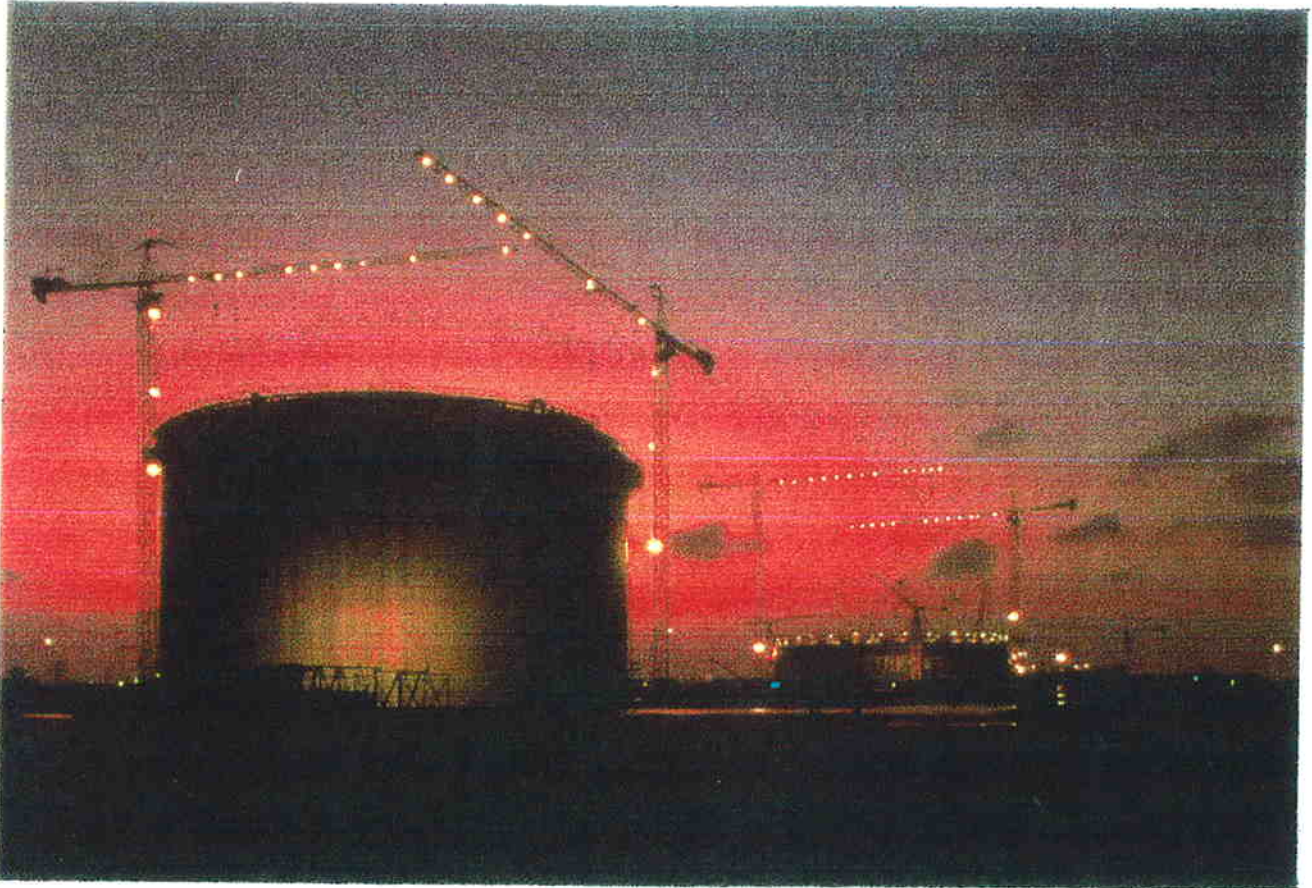


## VSL Cryogenic Post-Tensioning in the Middle East



▲ *Ra's Laffan sunset*

Four LNG Tanks (07T7101, 07T7102, 07T7103 and 07T7104) have been built in northern Qatar, at the Ra's Laffan site on the Persian Gulf shore.

Each tank has an 85,000 m<sup>3</sup> capacity, with a 66.90 m outer diameter and a 42.90 m overall height.

Each structure is prestressed as follows :

Horizontal tendons :

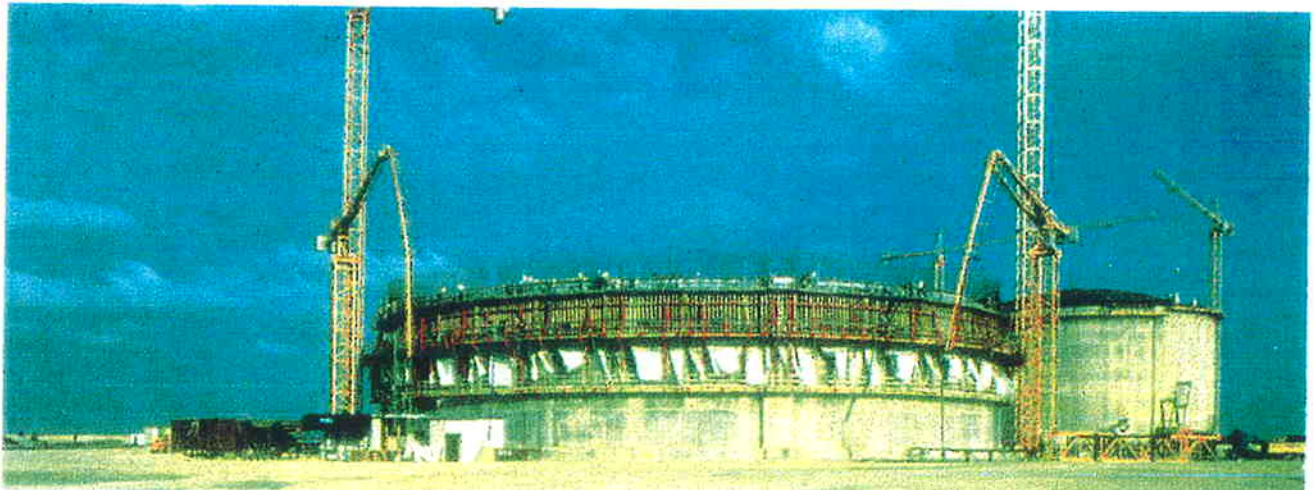
- bottom slab : 8 VSL EC 6-19 tendons, 109 m long,
  - walls : 66 VSL EC 6-19 tendons, 107 m long,
- all of them anchored on 4 ribs.

Vertical tendons :

- 92 U-shaped tendons VSL EC 6-12, 74 m long.

The horizontal tendons were installed strand by strand using strand pushers. The vertical tendons were pulled, after prefabrication of the whole tendon on the top of the walls, using an air winch pulling the entire cable into the thin steel walled U-shaped tubes.

*Tank 2 under construction* ▼



VSL's scope of works was as follows :

- supply of post-tensioning materials, including anchorages, corrugated steel ducts for horizontal tendons, thin steel walled U-shaped tubes for vertical tendons,
- provision of post-tensioning equipment on site, including hydraulic jacks, pumps, strand pushing machines, strand decoilers, grout mixers,

- technical assistance including : VSL's site supervisors during duct installation and post-tensioning operations.

VSL provided all technical specifications for post-tensioning the cryogenic structures and adapted work procedures to the particular site conditions. The works were approved by the engineer.

**OWNER :**

Qatar Liquefied Gas Company Ltd.

**ENGINEER :**

Chiyoda Corporation

**MAIN CONTRACTOR :**

TBMM (SN Technigaz / Bouygues / Mecon / Midmac)

**POST-TENSIONING :**

VSL France S.A.

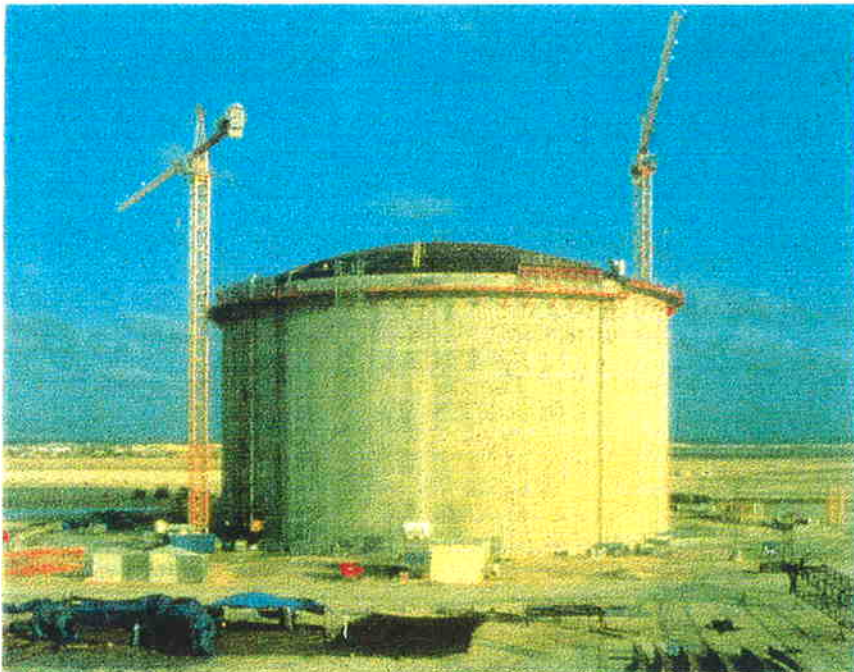
**CONSTRUCTION PERIOD :**

1994 - 1996

▼ Tanks 2 and 3 under construction



▼ Finishing the Tank 1 dome



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