Technology Award

Improvement of Productivity by Introduction of Large Scale Fully Precast Construction Method for PC LNG Tanks

Energy Production Department, Tokyo Gas Co., Ltd., Tokyo Gas Engineering Solutions Corporation, IHI Plant Services Corporation - Kajima Corporation Joint Venture

Reason for the Award

An important issue in LNG tank construction is shortening the construction time. Precasting of the outer tank is an effective means of shortening the construction time of above-ground PC LNG tanks, and in addition, it improves the quality of the structure and stability in the construction process. Therefore, for the Tokyo Gas Hitachi LNG Terminal Phase II, full precasting technology was adopted for the outer tank for construction of Japan's largest LNG tank. The effectiveness of precasting for construction of the outer tank was demonstrated by greatly shortening the construction time compared with the conventional in-situ construction method. New precast joints and embedded formwork were developed and adopted for precasting of the outer tank. The resulting early completion of the outer tank contributed to improved efficiency of parallel work (mechanical construction), and the achievement of high accuracy in the outer tank had the effect of improving the productivity of the mechanical work. As a result, the construction time of the complete tank was shortened greatly (by 11 months), and a major reduction was achieved in the on-site labor for construction of the outer tank (40% reduction in on-site workers). The effectiveness of applying precasting of the outer tank of above-ground PC LNG tanks to actual construction as described above has been demonstrated to simultaneously achieve a major reduction in construction time and improvement in productivity of the on-site LNG tank construction operation. This will have a big impact not only on LNG tanks but also in its effect of stimulating initiatives to improve productivity on all large-scale civil engineering structures by precasting. This work has been highly evaluated as pointing the way forward for the promotion of the precasting method in the future and has been recognized as deserving the Technology Award.