

## ELKEM ÍSLAND – Grundartangi



### SCOPE OF VERKÍS SERVICES

#### Projects for Elkem factory at Grundartangi:

- ▶ Furnace I and II projects: Design criteria for the HV, MV and LV system. Programming part of the PLC control system in auxiliary systems.
- ▶ Furnace III project: Project planning and cost estimate, pre-design, design criteria, tender documents for total electric-, control-, compressed air-, sprinkler- and cooling systems.
- ▶ Assisting in completing the contracts for the above mentioned systems.
- ▶ Participation in project management group in furnace III and e.g. CPM-planning and electrical site engineer in furnace I and II projects.
- ▶ Management of the electrical and control contract, design and process surveillance and assisting in final closure of the contracts.
- ▶ Follow-up of factory and functional tests, start-up and acceptance tests for all above mentioned projects.
- ▶ Assisting in miscellaneous electrical, mechanical and environmental projects in the running time of the factory from 1979, e.g. design and supervise new capacitor banks, design and supervise renovation of MV circuit breakers, control systems for e.g. filters-, raw materials- and furnace control systems etc.

### DESCRIPTION

In 1977 the Icelandic Alloys Ltd. (now Elkem Ísland) started the construction of a FeSi factory at Grundartangi. Initially the first phase design criteria assumed a factory equipped with one furnace and necessary infrastructure. At the same time Icelandic Alloys Ltd. signed a revised contract with Landsvirkjun for the purchase of electricity for a three-oven plant. Early on in the first phase a second furnace was added. Furnace I and II were in full production in 1980. The third furnace was added in phase two which started in 1995. Furnace III was in full production in the year 1999.

The furnace load of the factory is about 120 MV, annual FeSi production 120 thousand metric tons, and energy consumption around 945 GWh per year.

#### General information

Elkem Ísland (former Icelandic Alloys Ltd.) was established April 28, 1975 by the Icelandic government in cooperation with the American company Union Carbide. In 1976 Union Carbide withdrew from the Company and Elkem took their place. The Japanese company, Sumitomo Corporation, became a stockholder in 1984. In 2003, Elkem AS became the only shareholder.

Elkem Ísland operates a FeSi plant located at Grundartangi in Hvalfjörður west Iceland. The plant was fully equipped with three furnaces in 1999. In 2006 the decision was made to start production of MgFeSi (nodularisers for the iron foundry industry) at Elkem (then Icelandic Alloys). The new MgFeSi plant started production in the spring of 2008.

### TECHNICAL INFORMATION

**Total power usage**  
about 150 MW

#### Main power transformer:

1x 100 MVA, 3 ph 220/33 kV  
1x 68.5 MVA, 3 ph 220/33 kV

#### Furnace transformers:

3 x 20 MVA, for furnace I  
3 x 20 MVA, for furnace II  
3 x 28 MVA, for furnace III  
All. 1 ph 33/0.2-0.345 kV.

#### Power transformer:

3 x 10 MVA, 3 ph 33/6.6 kV

#### Aux. Power transformers:

8 x 1.6 MVA, 3 phase 6.6/0.4 kV

#### Capacitor banks: 33 kV

2 x 10 MVar and 2 x 20 MVar 8.1 MVar, 16.2 MVar, 32.6 MVar  
2 x 12 MVar

#### Outdoor switchyard 220kV:

Incoming field, 2 x outgoing feeders, overhead bus bar

#### Power cables 220 kV:

1x3x400mm<sup>2</sup>, ca. 400m

#### Indoor switchgear 33 kV:

Air isolated, 8 OM-CB and 4 disconnectors for furnace I&II  
SF6 isolated, 6 vacuum CB and two disconnectors for furnace III

#### Indoor switchgear 6,6 kV:

Air isolated cubicles with 16 OM-CB for furnace I&II  
Nitrogen isolated cubicles with 8 vacuum CB for furnace III

#### Emergency generator:

2 x 630 kVA, 400 V and  
800 kVA, 400 V

Verkís hf. is the merger of VST hf.,  
Rafteikning hf., Fjarhitun hf.,  
Fjölhönnun ehf. and RT ehf.

