



*the***Mill**  
for**Minimills**

# LADLE FURNACE (LF)

## MECHANICAL DESIGN

**CVS MAKINA** - *Company Presentation*



**YOUR ONE STOP SOLUTION PROVIDER  
FOR MELTSHOP AND ROLLING MILL**



- Design
- Manufacturing
- Erection
- Training
- Consultancy
- Innovation
- Process Development



- Offices:
- CVS Headquarter (Turkey)
  - CVS Europe (Italy)
  - CVS Egypt
  - CVS Ukraine
  - CVS Iran

**FROM CONCEPT TO COMMISSIONING**

[info@cvs.com.tr](mailto:info@cvs.com.tr)

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## CVS MAKINA - Company Presentation



for *the* **Mill**  
**Minimills**

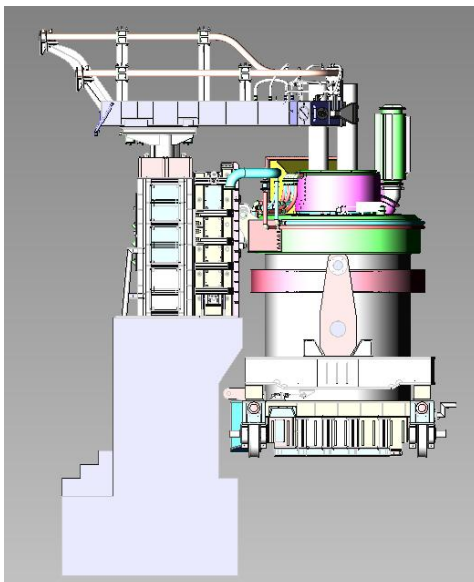


- CVS provides plants & equipment for minimills, also in “turn-key” solution.
- CVS covers the complete design and manufacturing activities for green-field projects as well as revamping/upgrading of existing plants and equipment.
- CVS manufactures spare parts & components for meltshops & rolling mills.
- CVS provides technical assistance and consulting service to steel production.

## CVS MAKINA - Company Presentation



for *the* **Mill**  
**Minimills**



### Quick Info

- CVS headquarter is placed in the industrial region of Gebze, just east of Istanbul, close to many major ports
- Our modern facilities consists of more than 40,000 sqm of closed area and a land of additional approx. 40,000 sqm
- CVS workforce is formed by over than 500 specialized workers and engineers with a modern machinery park to undertake even the most challenging projects.
- Over than 200 engineers and administrative employees are involved in the design and management of the projects.

## CVS - SECONDARY METALLURGY LF. Advantages



➤ The advantages of a ladle furnace can be defined as follows :

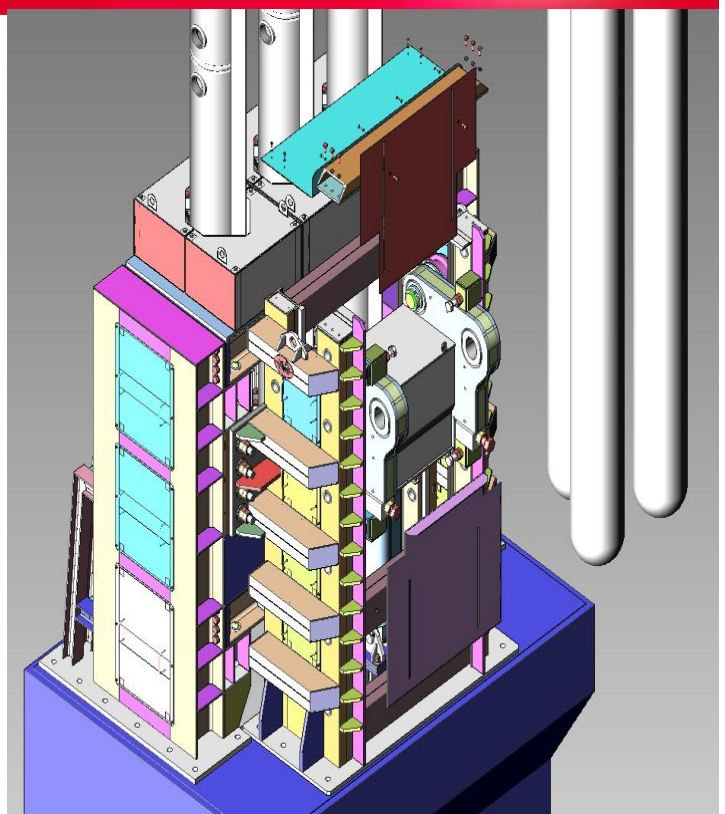
- Saving of ferroalloy
- Saving of energy
- Increase productivity
- Decreasing refining time of EAF
- Decreasing tapping temperature at EAF
- Precise temperature control
- Improved of inclusions, cleanliness of the steel
- Possibilities of wrong analysis limited



## CVS - SECONDARY METALLURGY LF Design Advantageous

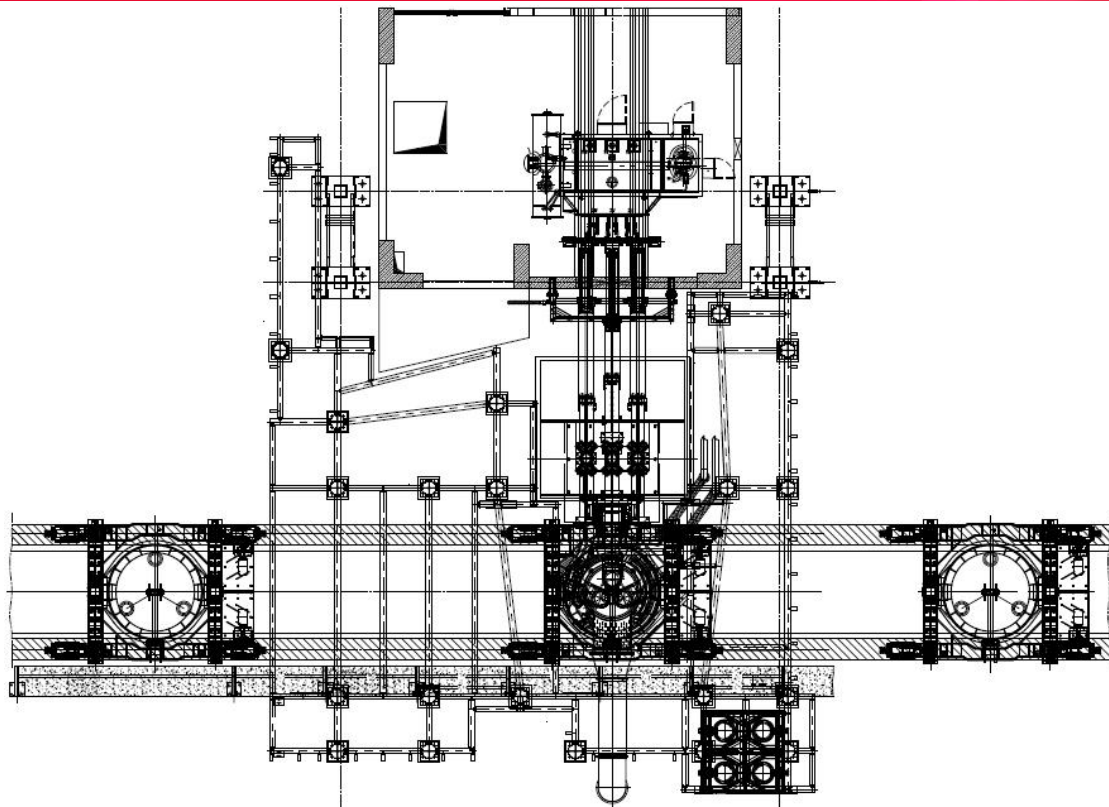


- The Ladle Furnace is conceived for reheating the steel in the ladle placed on a ladle car and will be designed and built according to the most modern techniques in the field and will be in particular provided with:
- Water-cooled secondary circuit and water cooled flexible cables
- Water-cooled ladle roof equipped with indirect fume collecting hood to reduce steel oxidation
- Roof lifting mechanism via hydraulic cylinder
- Electrode arms with reduced electrode pitch diameter
- Water-cooled secondary circuit and water cooled flexible cables
- Electro-hydraulic electrode regulation

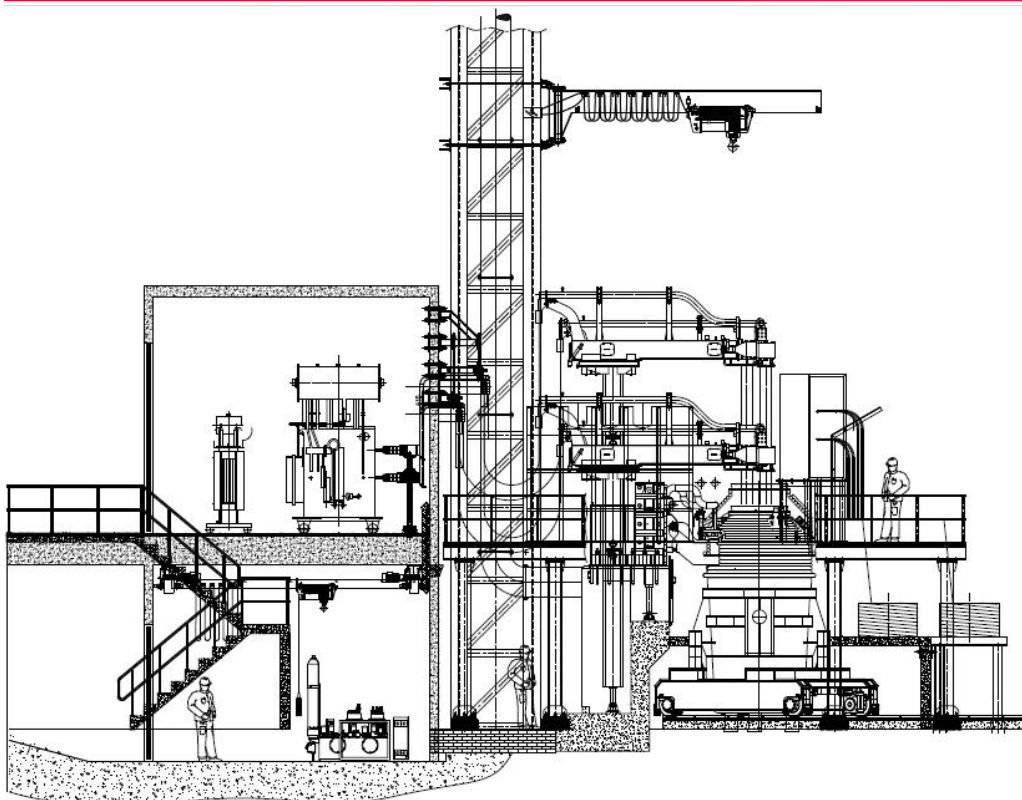




## LF - GENERAL PLAN VIEW



## LF - SIDE VIEW



- Saving of Ferroalloy
- Saving of Energy
- Increase Productivity
- Precise Temperature Control
- Cleanliness of The Steel

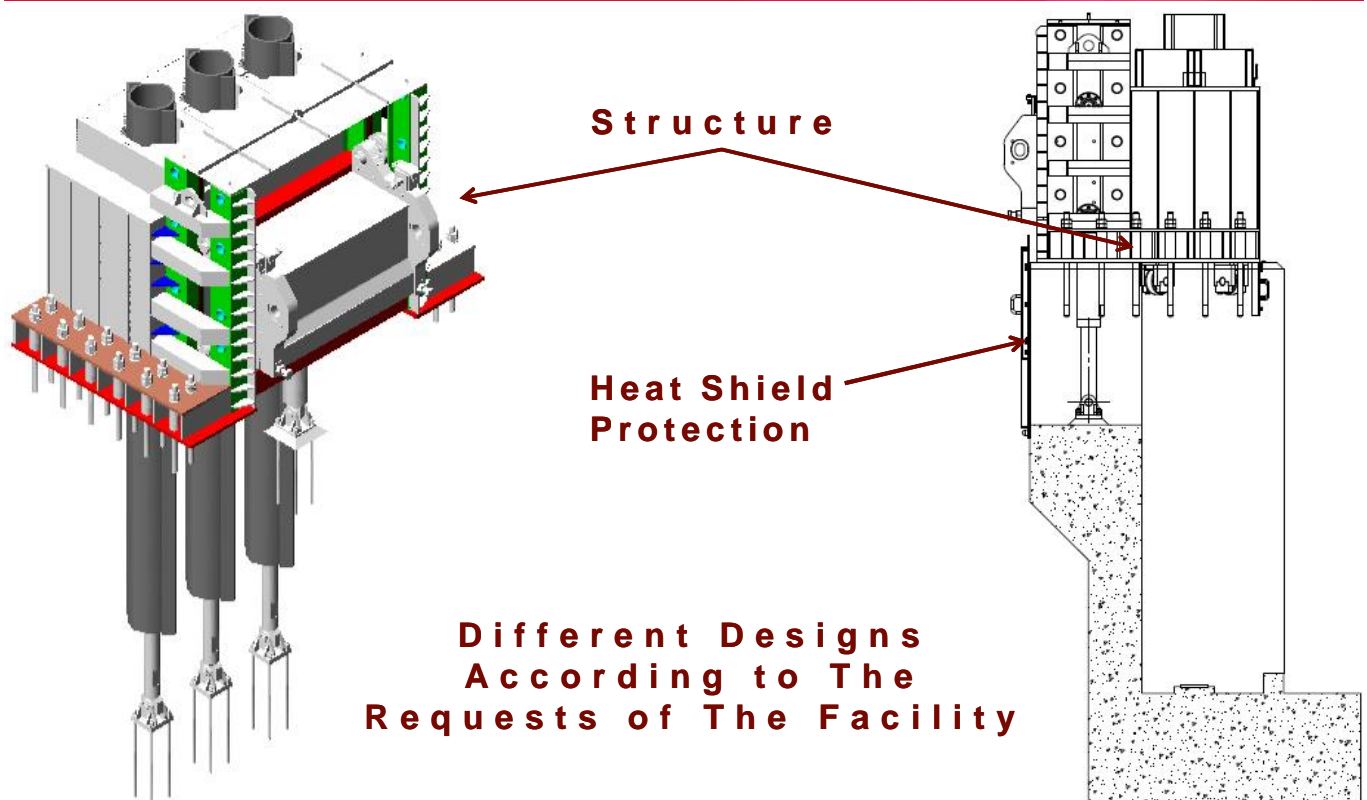
## LF - EQUIPMENTS



### MAIN EQUIPMENTS

Furnace Support Structure  
Roof Lifting Device  
Electrode Lifting System  
Electrode Arms  
Transformer  
Secondary Circuit  
Water Cooled Roof  
Water Cooled Pipes for Direct Suction  
Sampling and Measuring Devices  
Emergency Lance  
Electrode Nippling System  
Material Handling System  
Wire Feeding Machine  
Ladle Car  
Hydraulic Unit

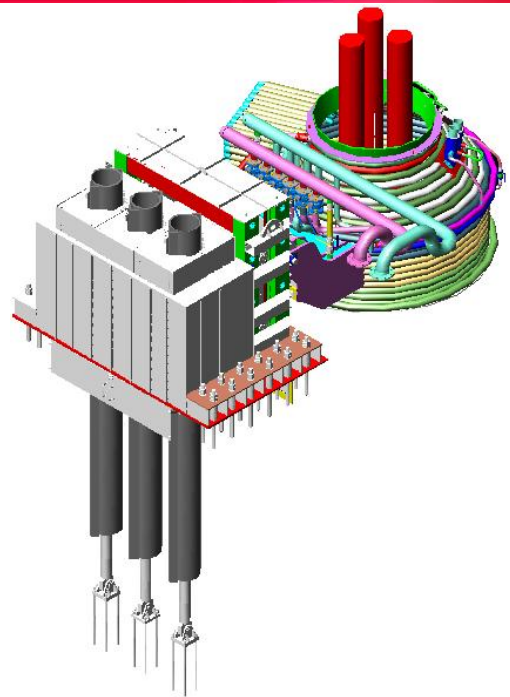
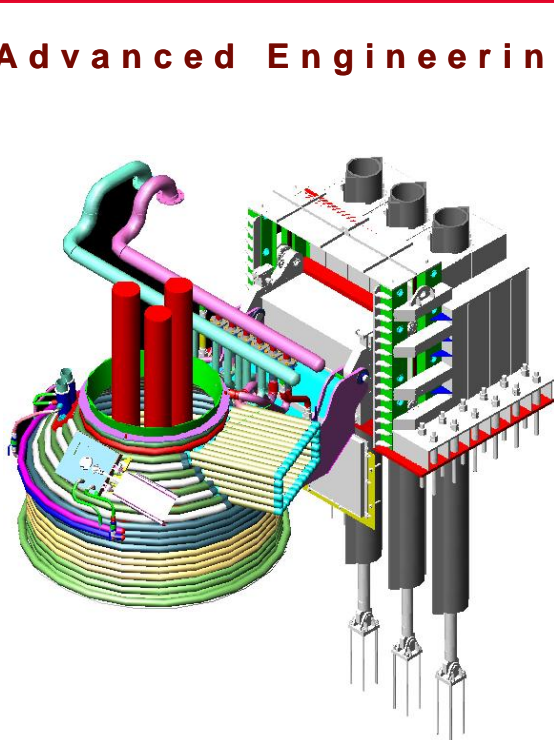
## SUPPORT STRUCTURE



## ROOF & ELECTRODE LIFTING SYSTEM



**Advanced Engineering**

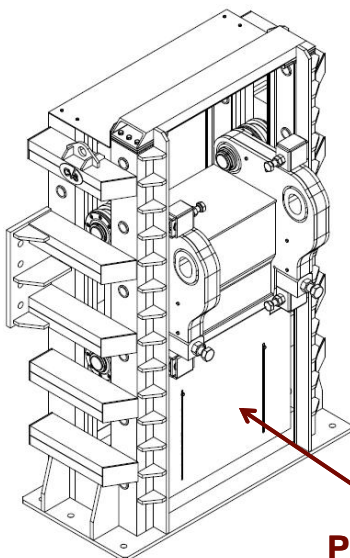


**Creative Solutions**

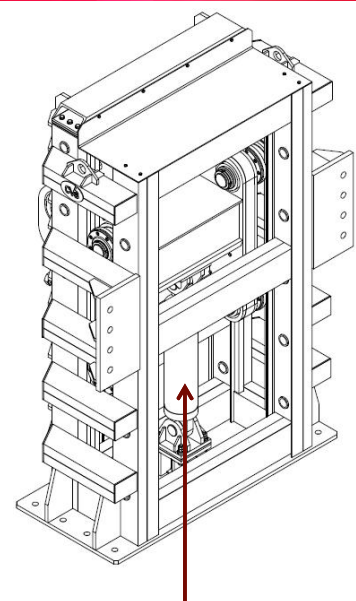
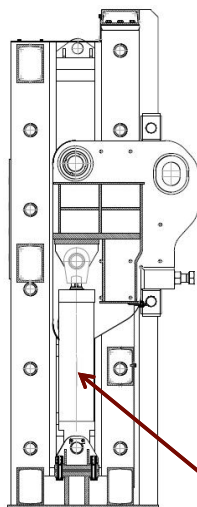
## ROOF LIFTING DEVICE



**Any Kind of Lifting Systems**



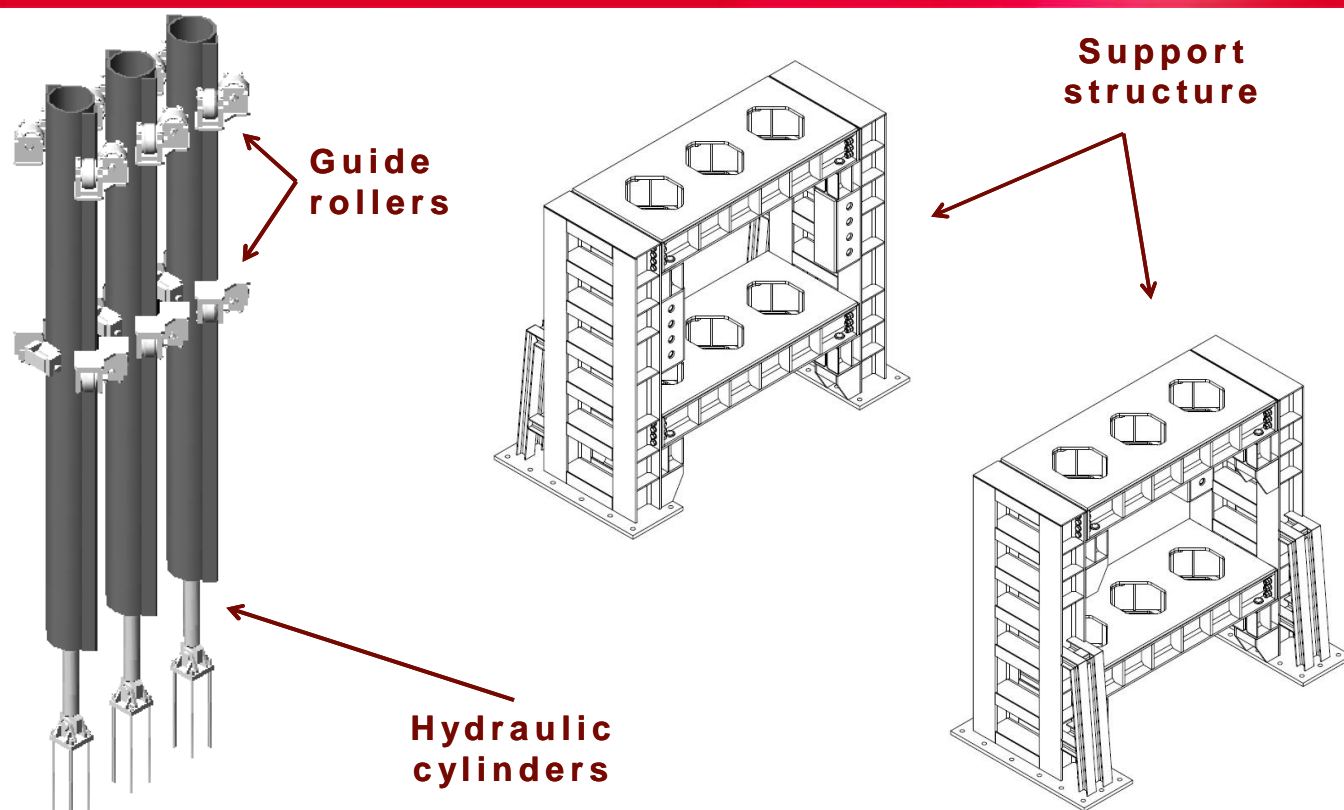
**Protection**



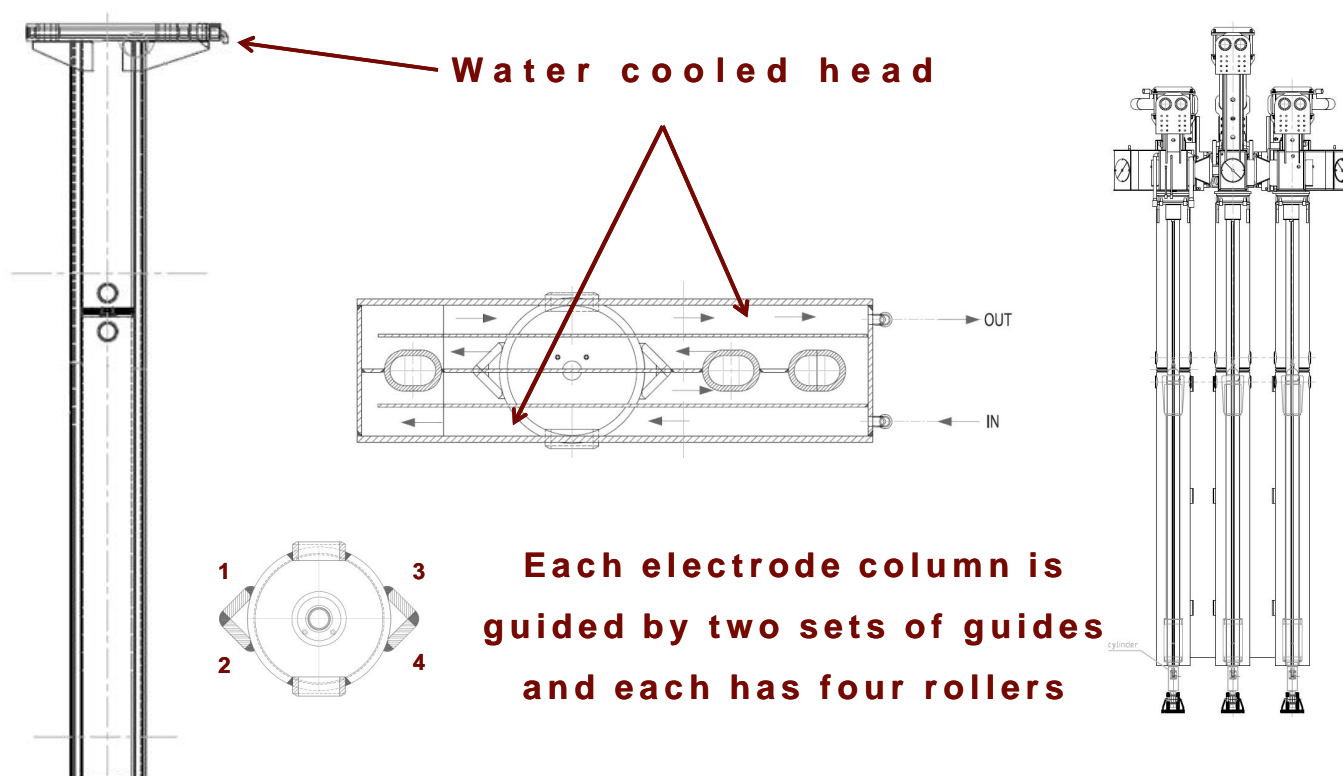
**Roof lifting  
mechanism via  
hydraulic cylinder**



## ELECTRODE LIFTING SYSTEM



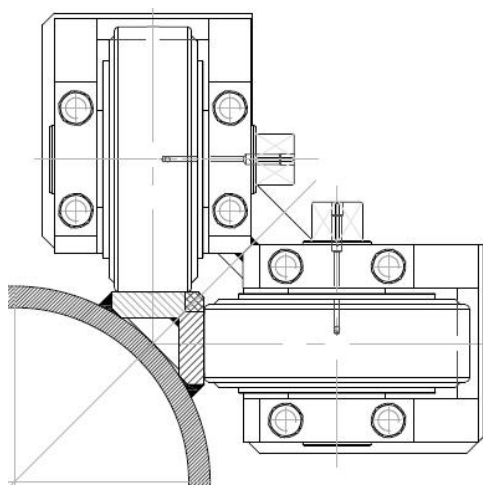
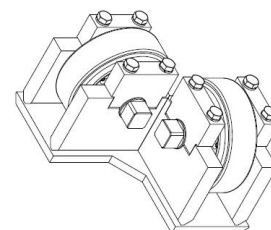
## ELECTRODE COLUMNS



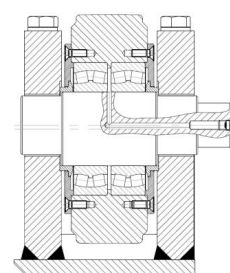
## ELECTRODE COLUMNS - GUIDES



**The Guide Rollers Are Lubricated By  
a Centralized Lubrication System**



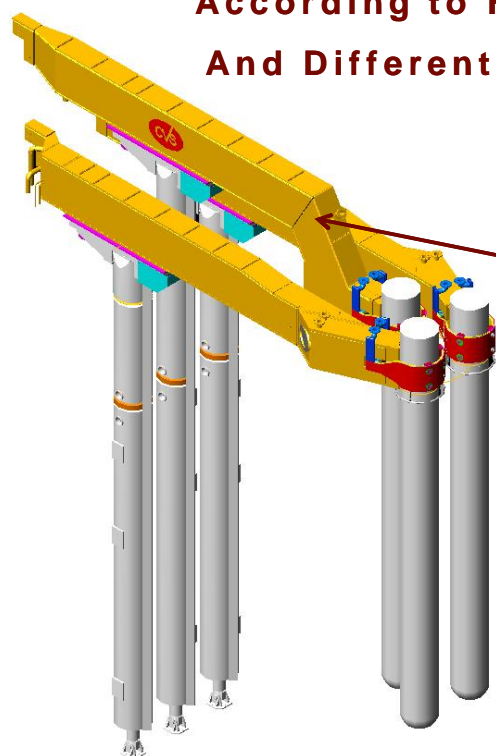
**4 Top and  
4 Bottom  
to Guide  
Each  
Electrode  
Column**



## ELECTRODE ARMS

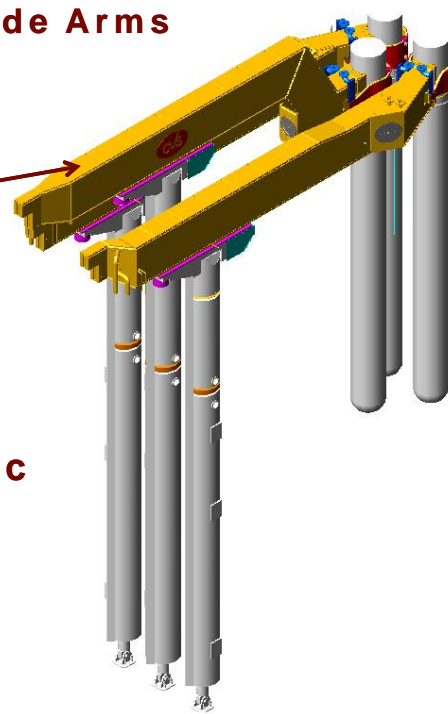


**According to Furnace Capacities Suitable  
And Different Designs of Electrode Arms**



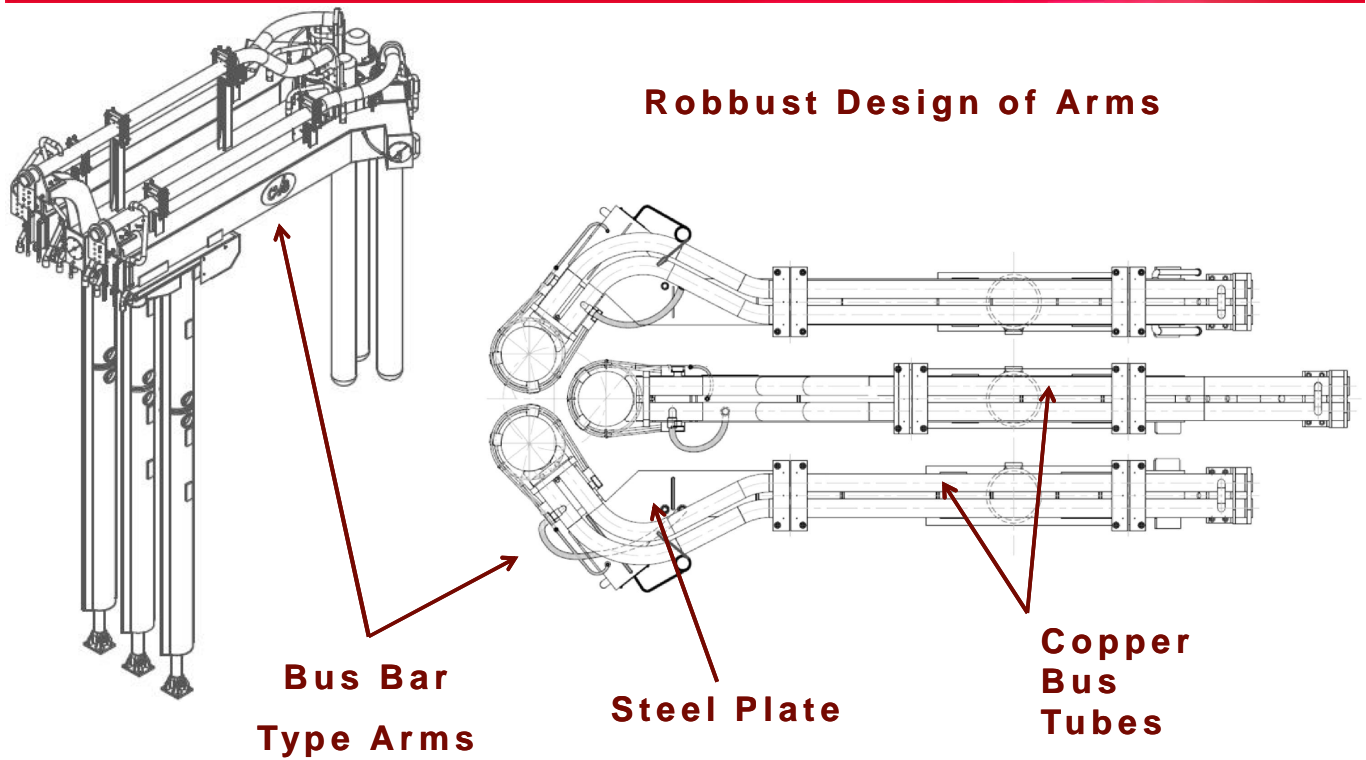
**Copper  
Cladded Type  
Arms**

**Electro-Hydraulic  
Electrode  
Regulation**

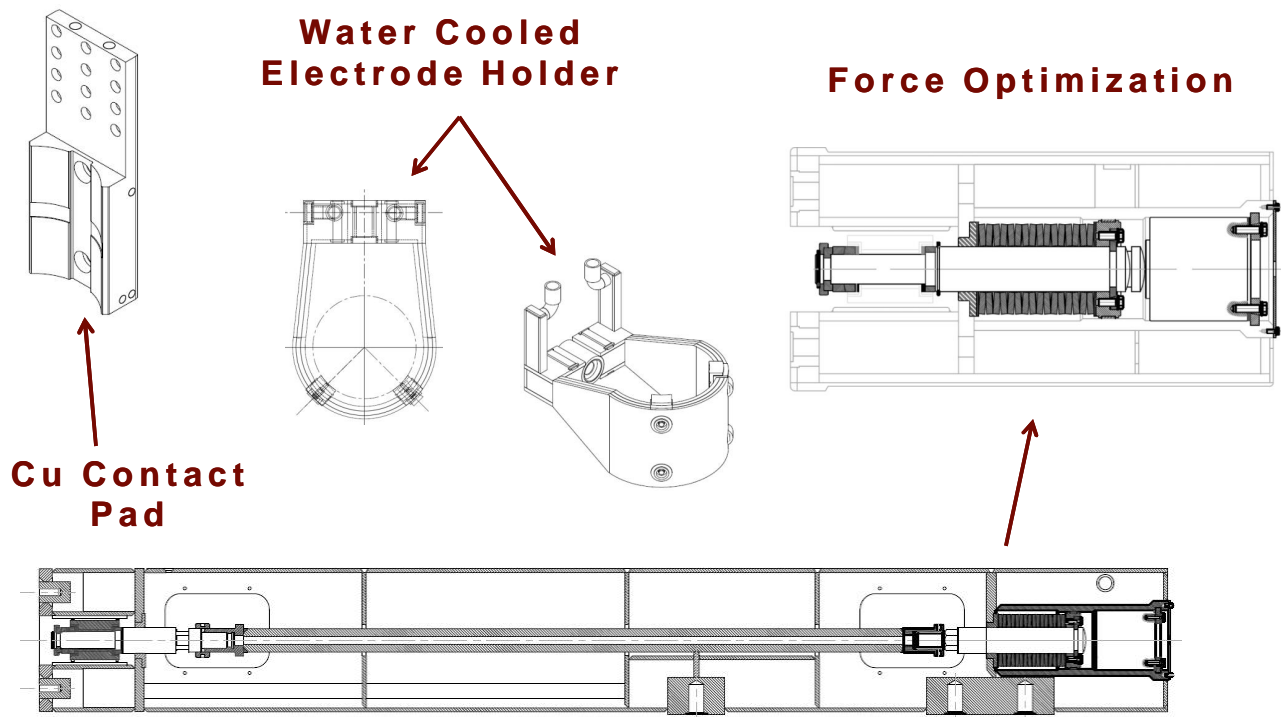




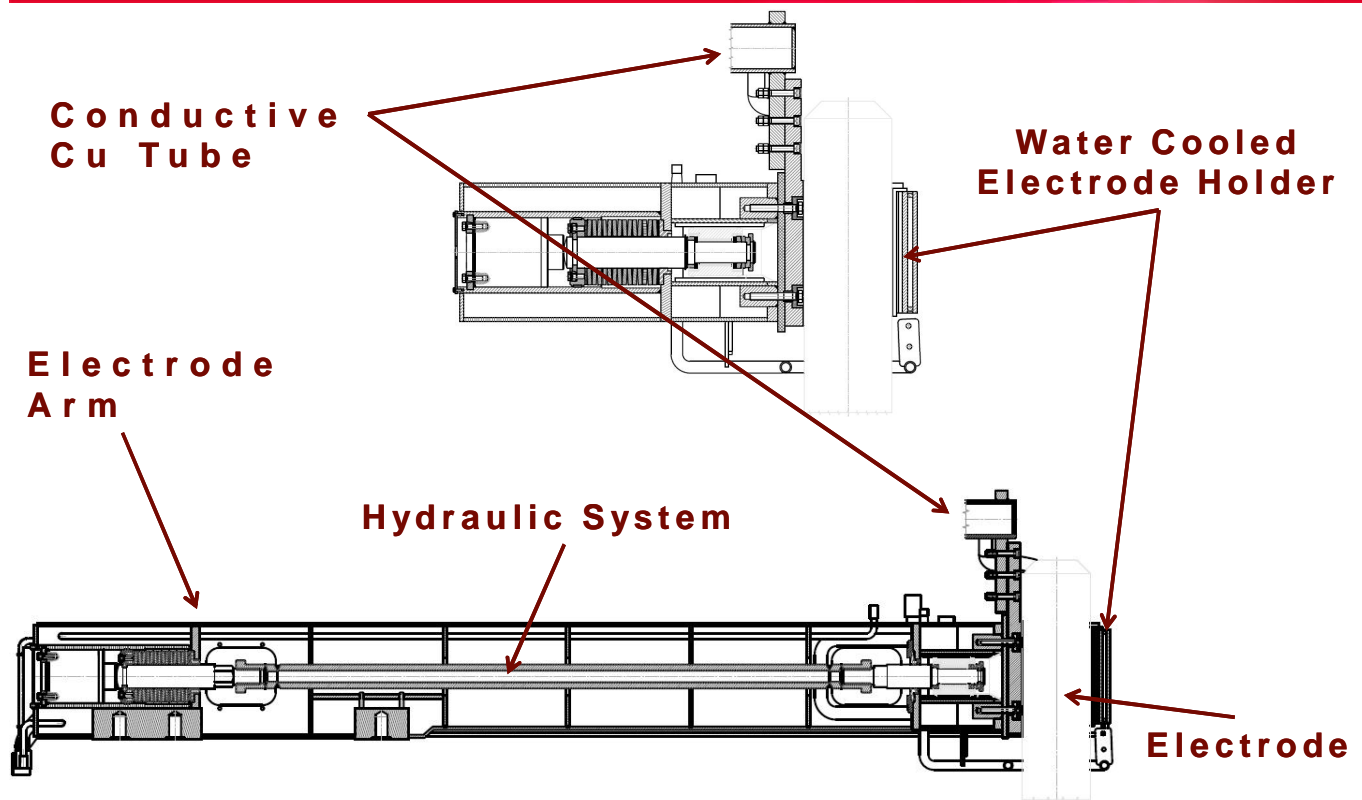
## ELECTRODE ARMS



## ELECTRODE HOLDING SYSTEM



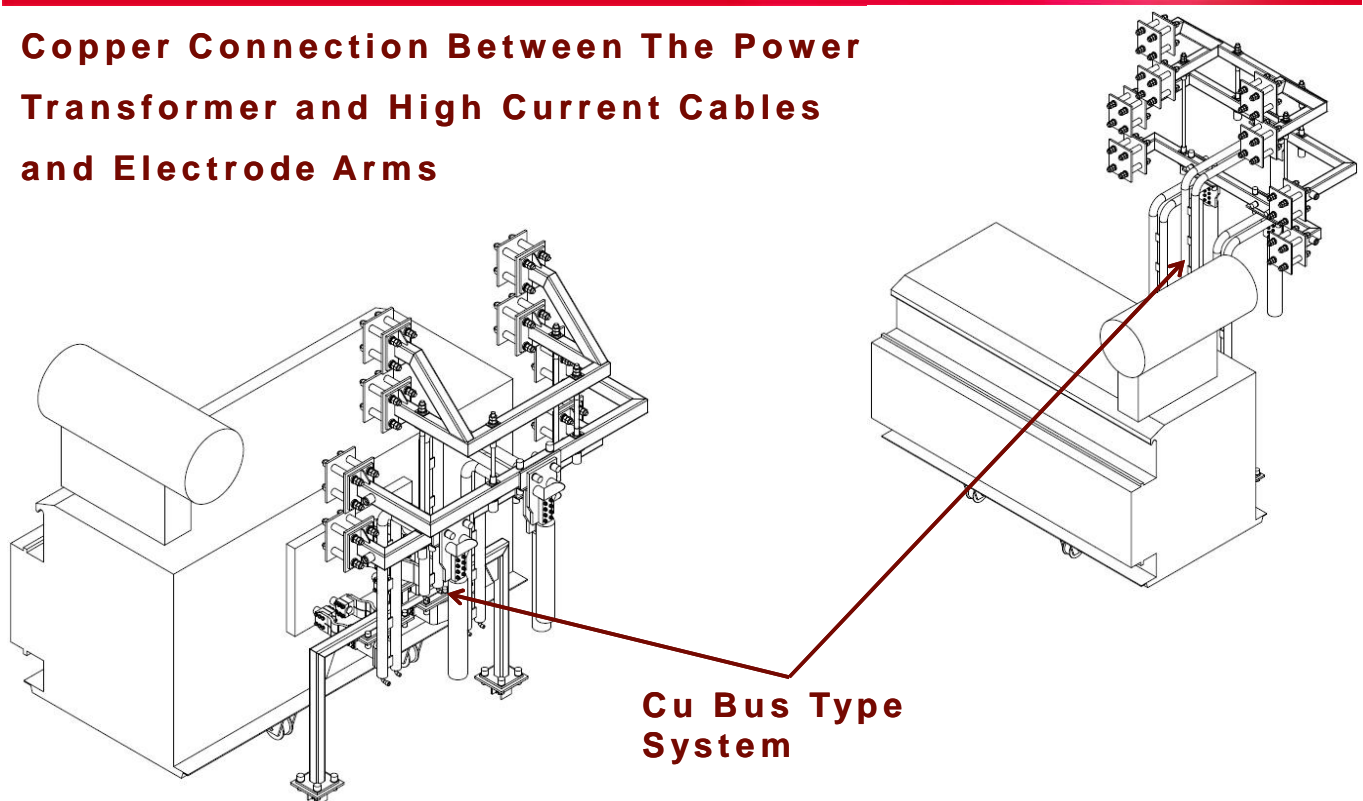
## ELECTRODE HOLDING SYSTEM



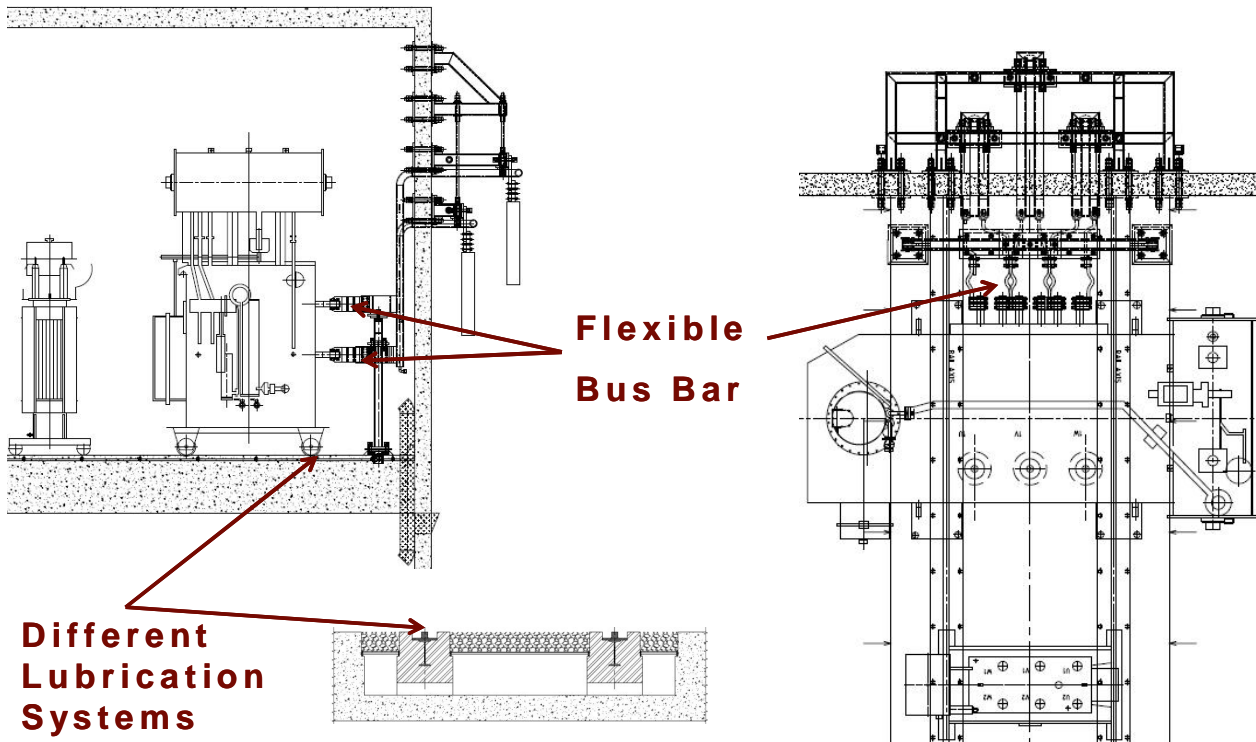
## SECONDARY CIRCUIT



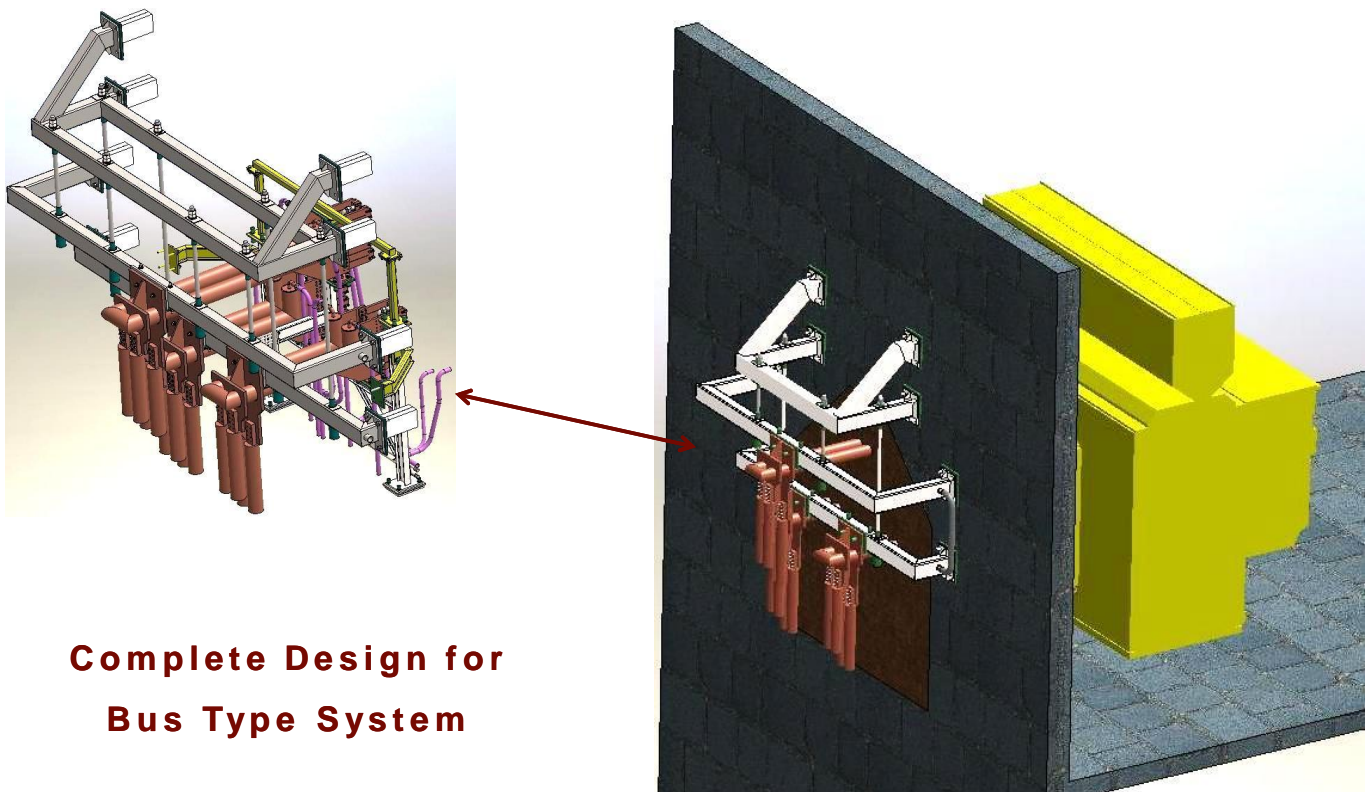
**Copper Connection Between The Power Transformer and High Current Cables and Electrode Arms**



## SECONDARY CIRCUIT



## BUS TYPE SYSTEM

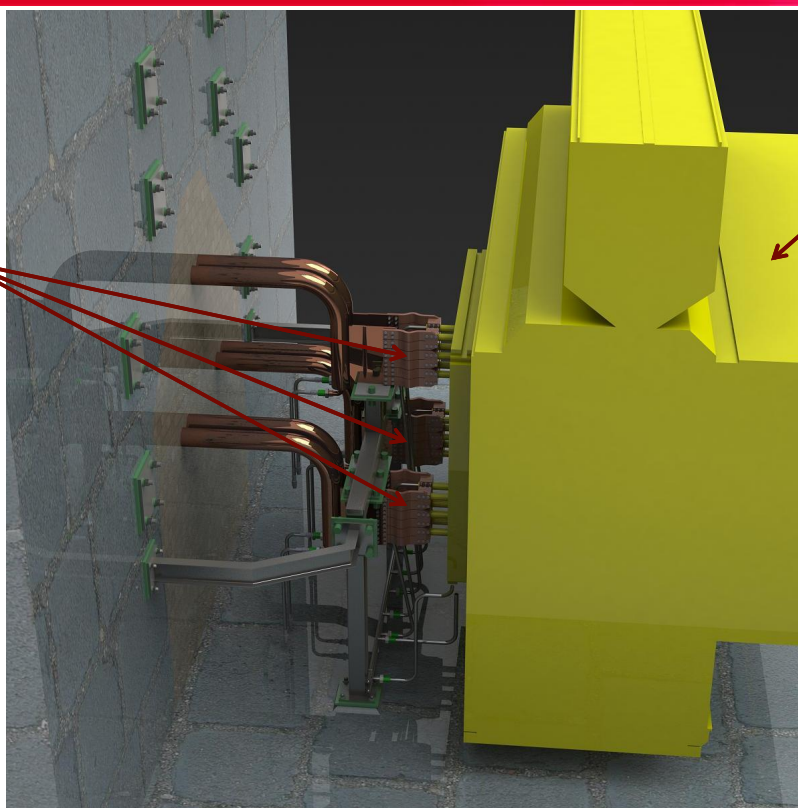




## BUS TYPE SYSTEM



**Flexible  
Bus Bar**

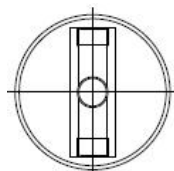
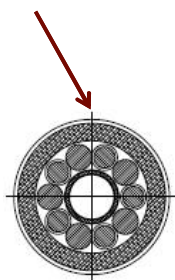


**Transformer**

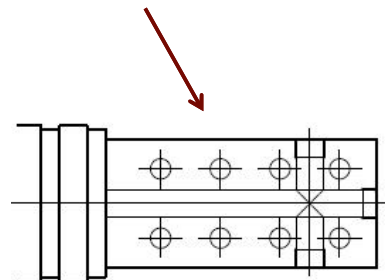
## WATER COOLED CABLES



**Water Cooled Cables**

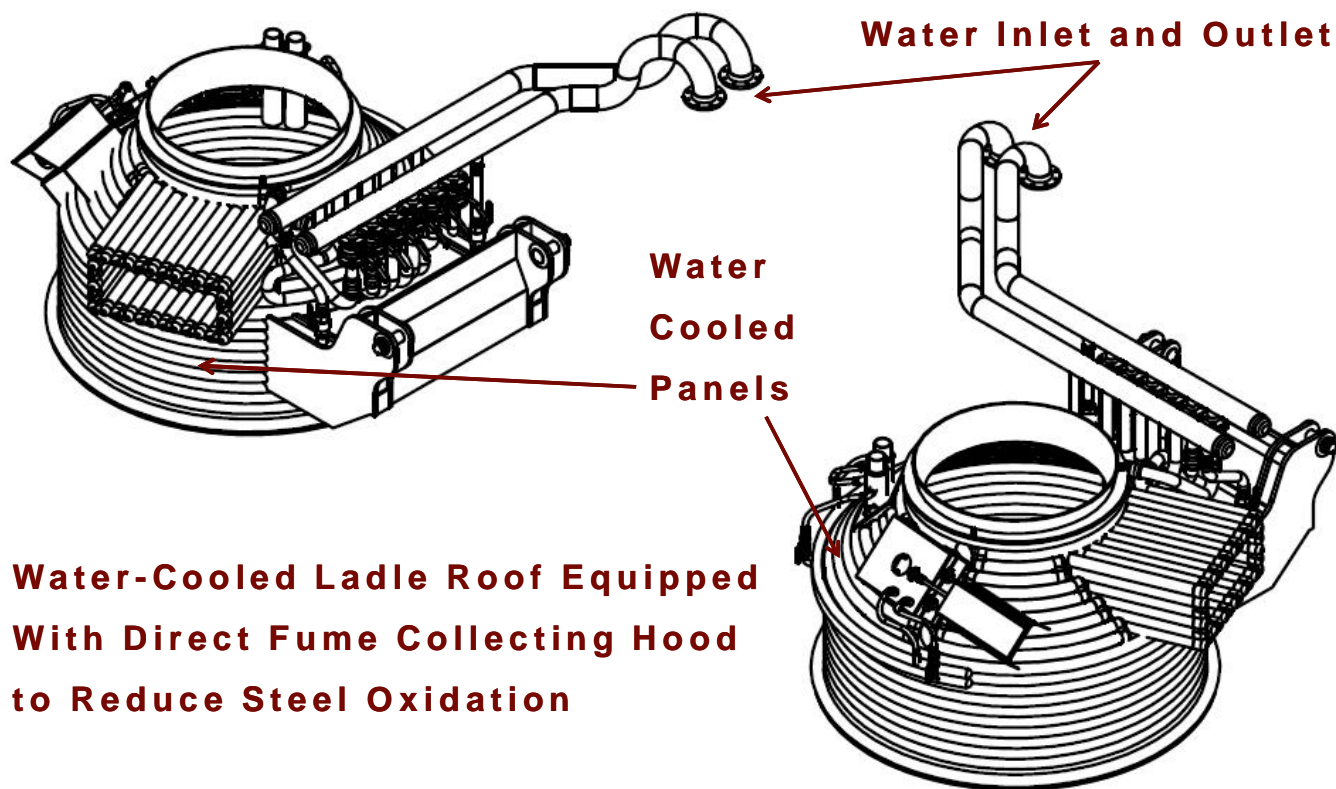


**Head Connection**

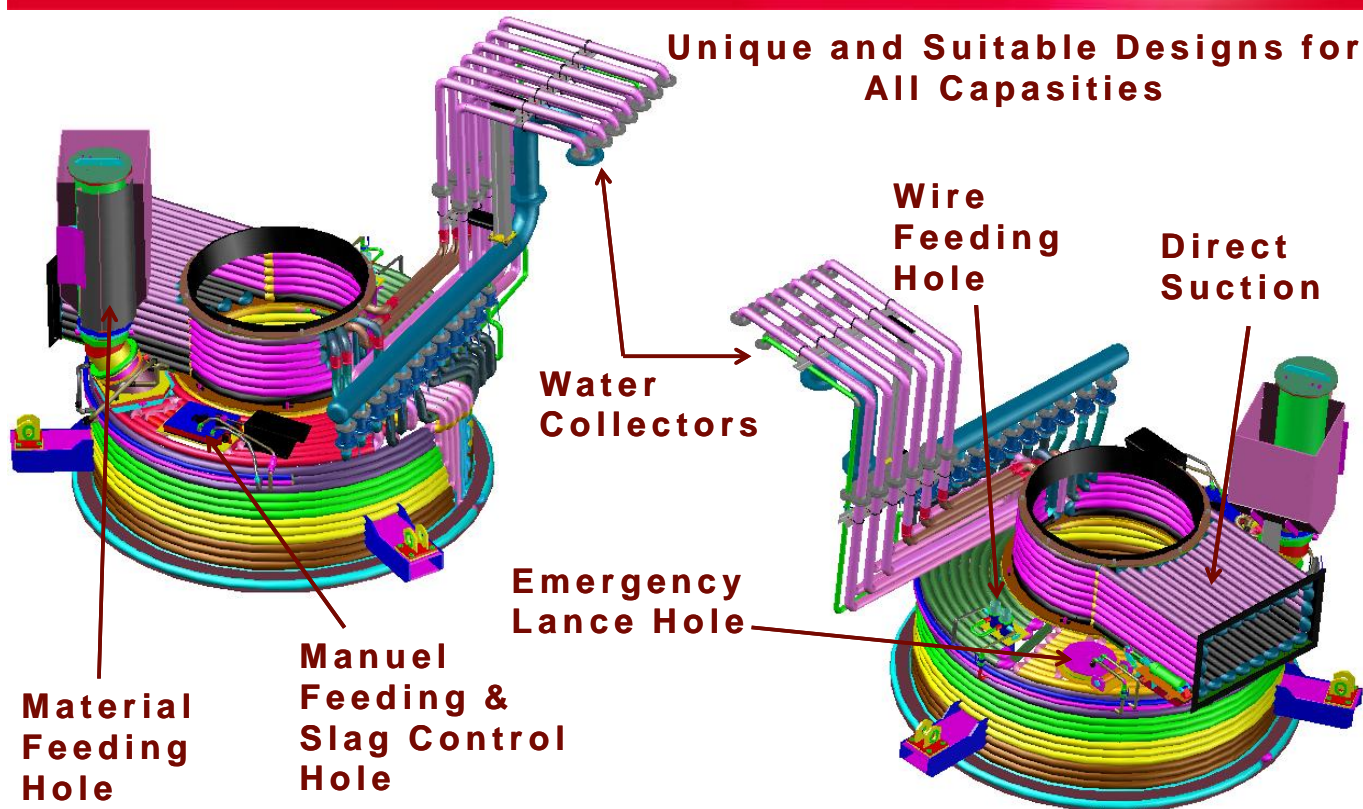


**Connection Between Furnace Electrode Arms and  
Transformer Secondary System**

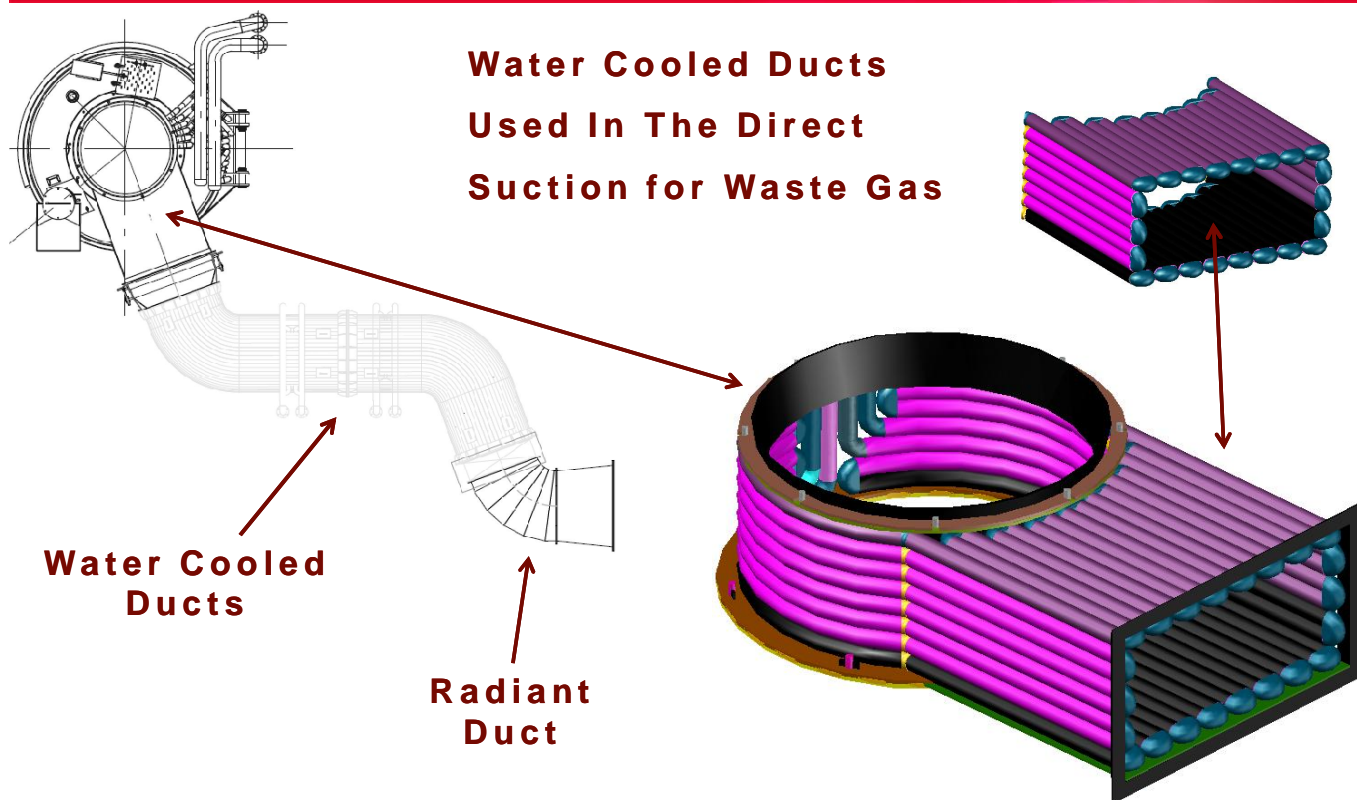
## WATER COOLED ROOF



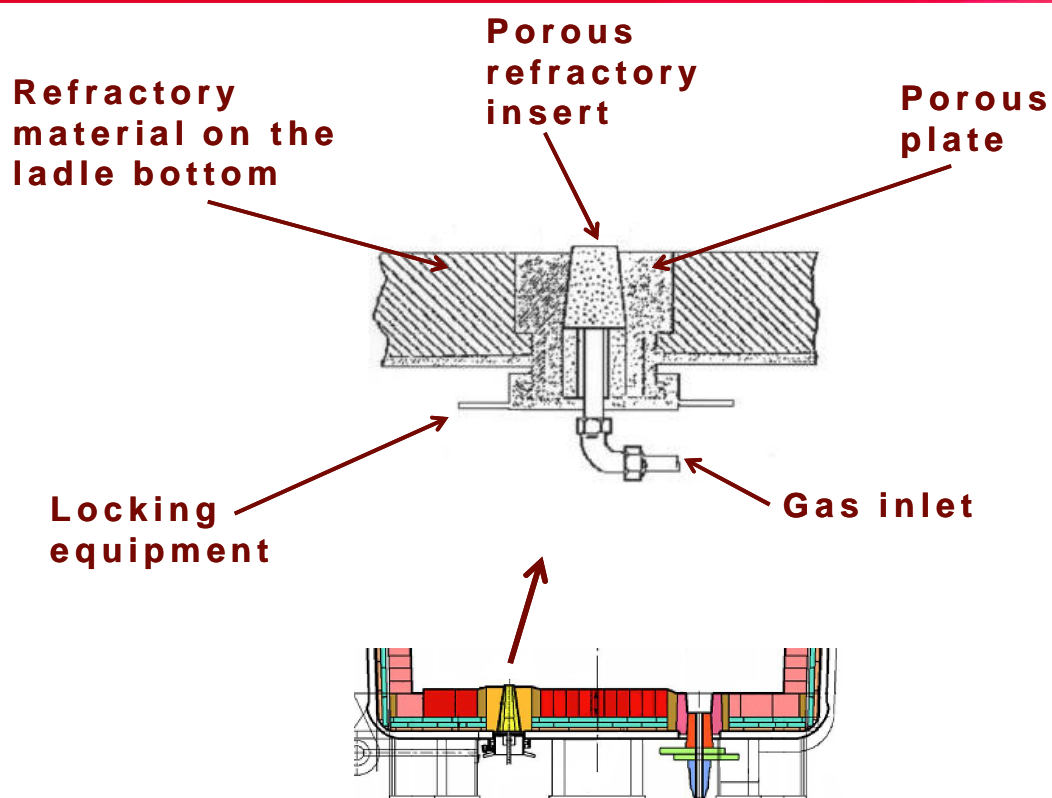
## WATER COOLED ROOF



## WATER COOLED PIPES FOR SUCTION



## LADLE INERT GAS USE

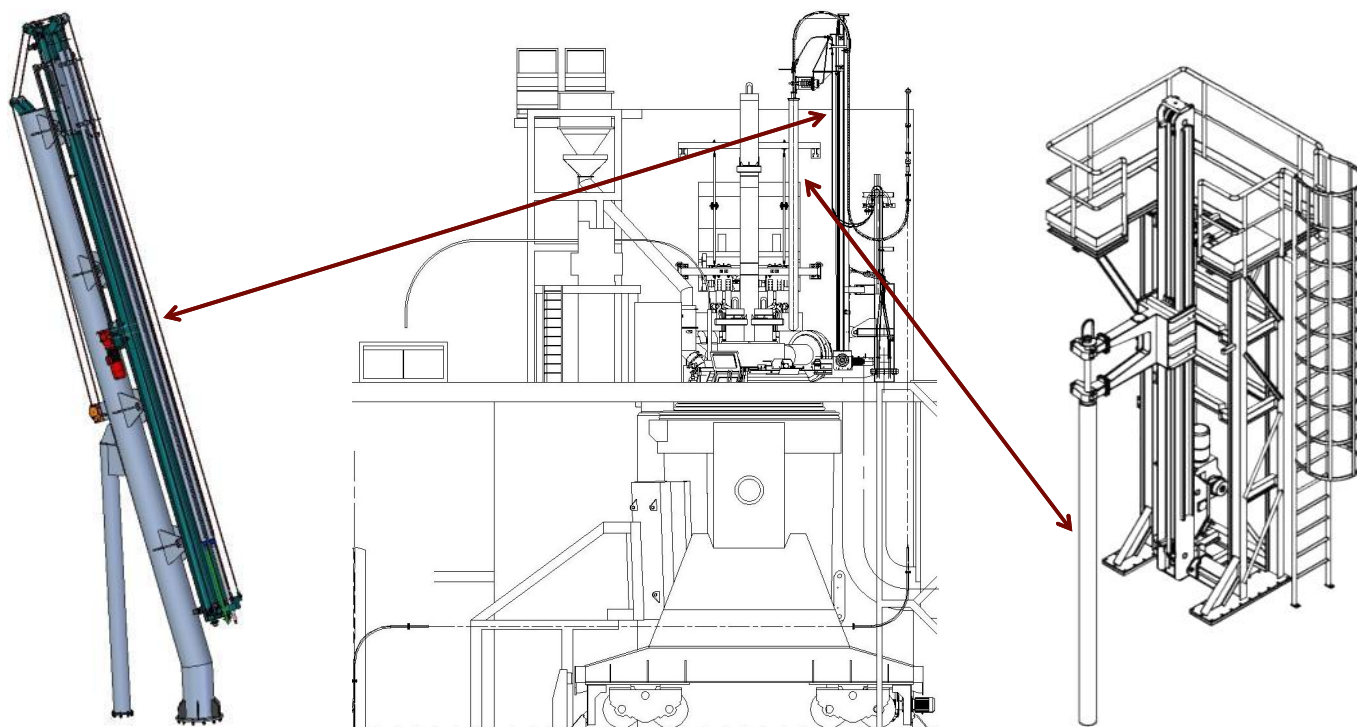




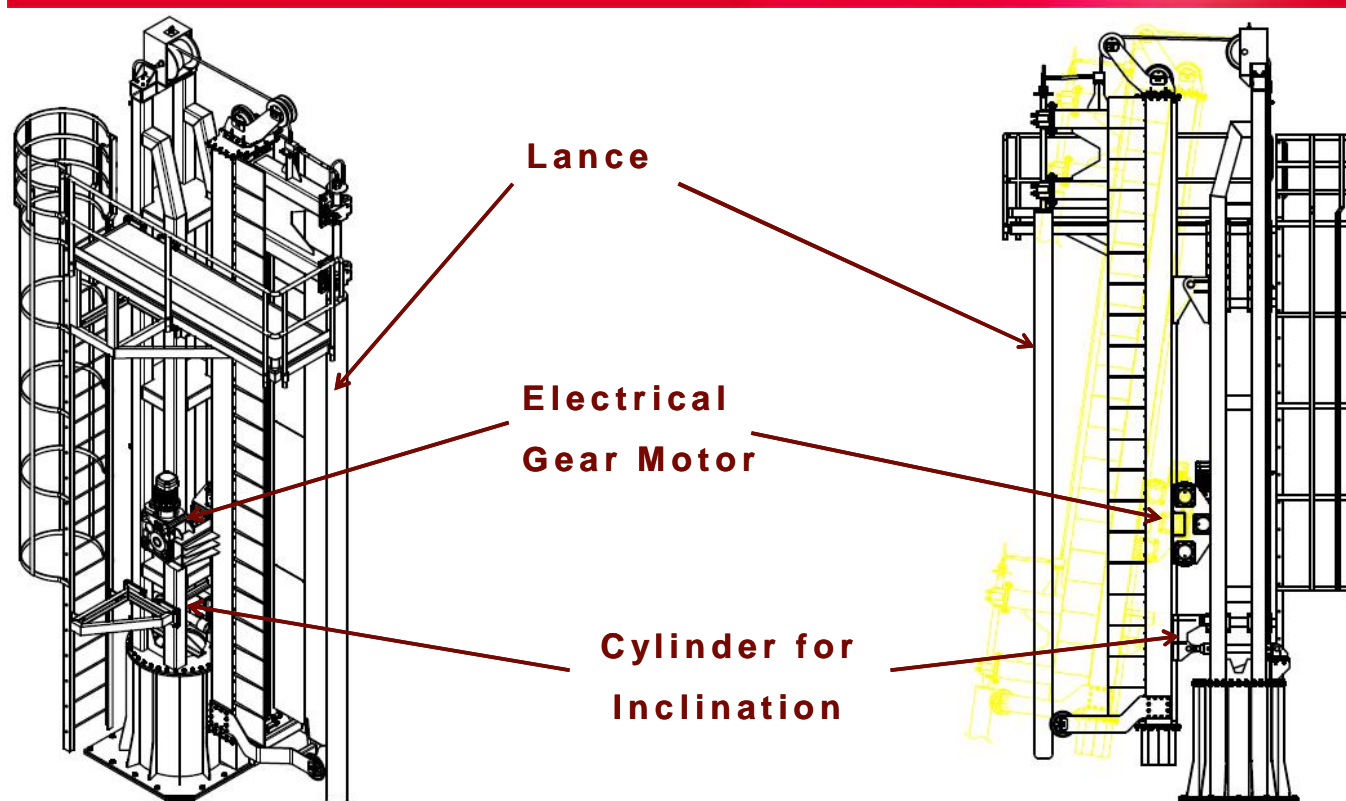
## EMERGENCY LANCE



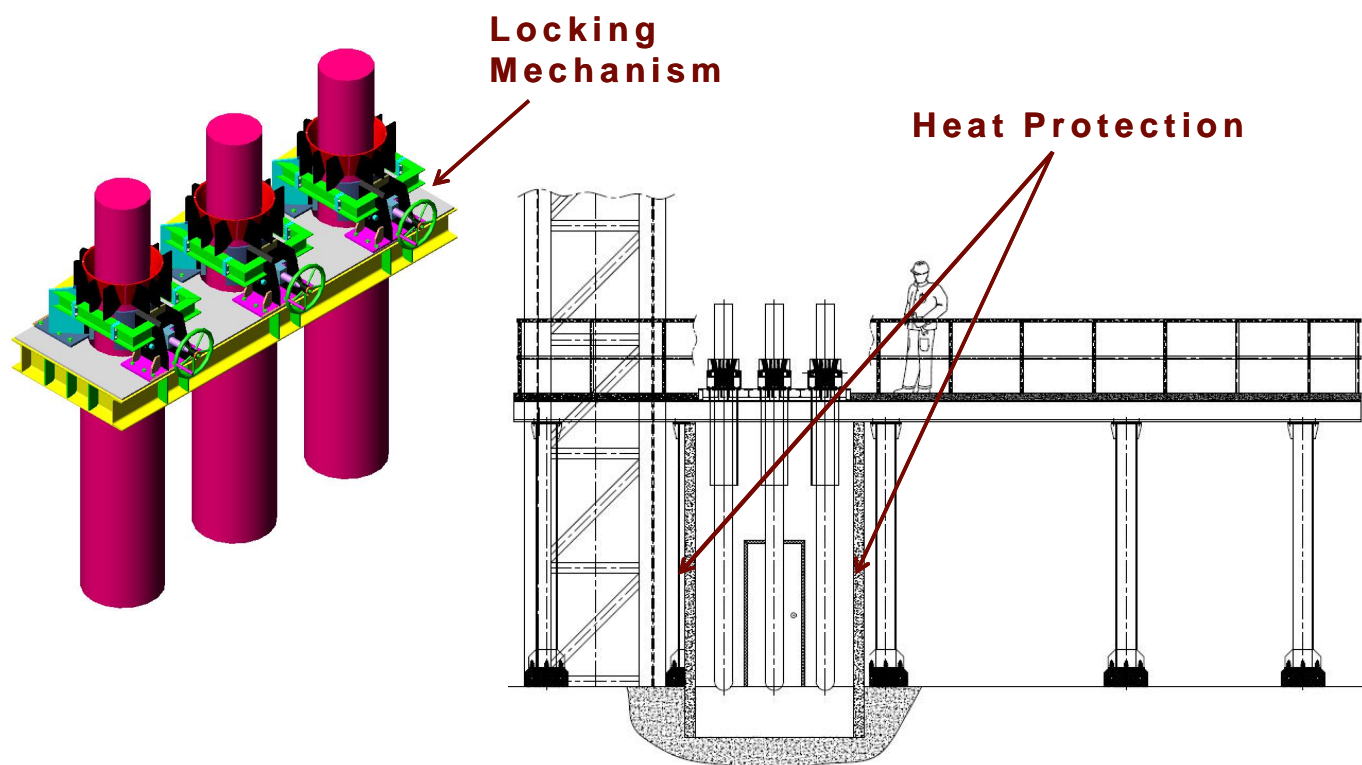
### Fully Automatic System



## EMERGENCY LANCE



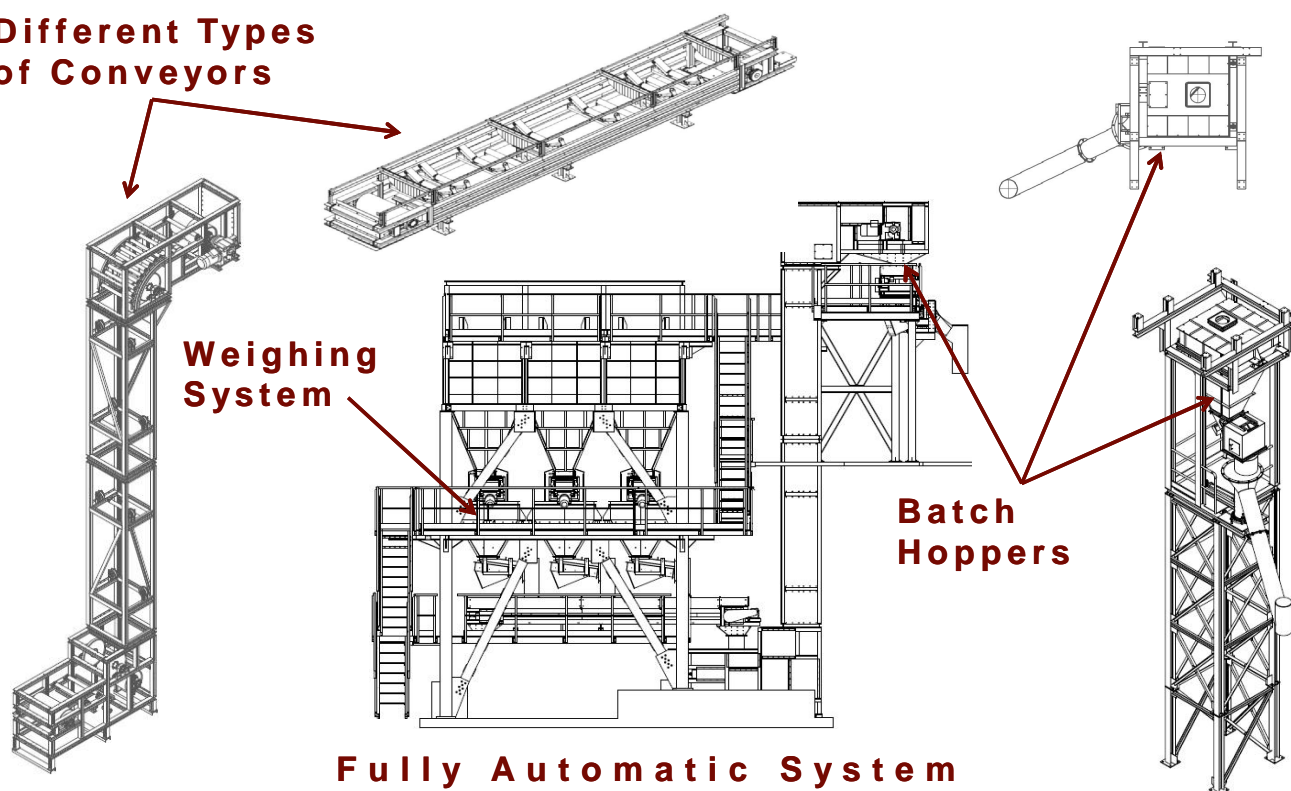
## ELECTRODE NIPPLING SYSTEM



## MATERIAL HANDLING SYSTEM

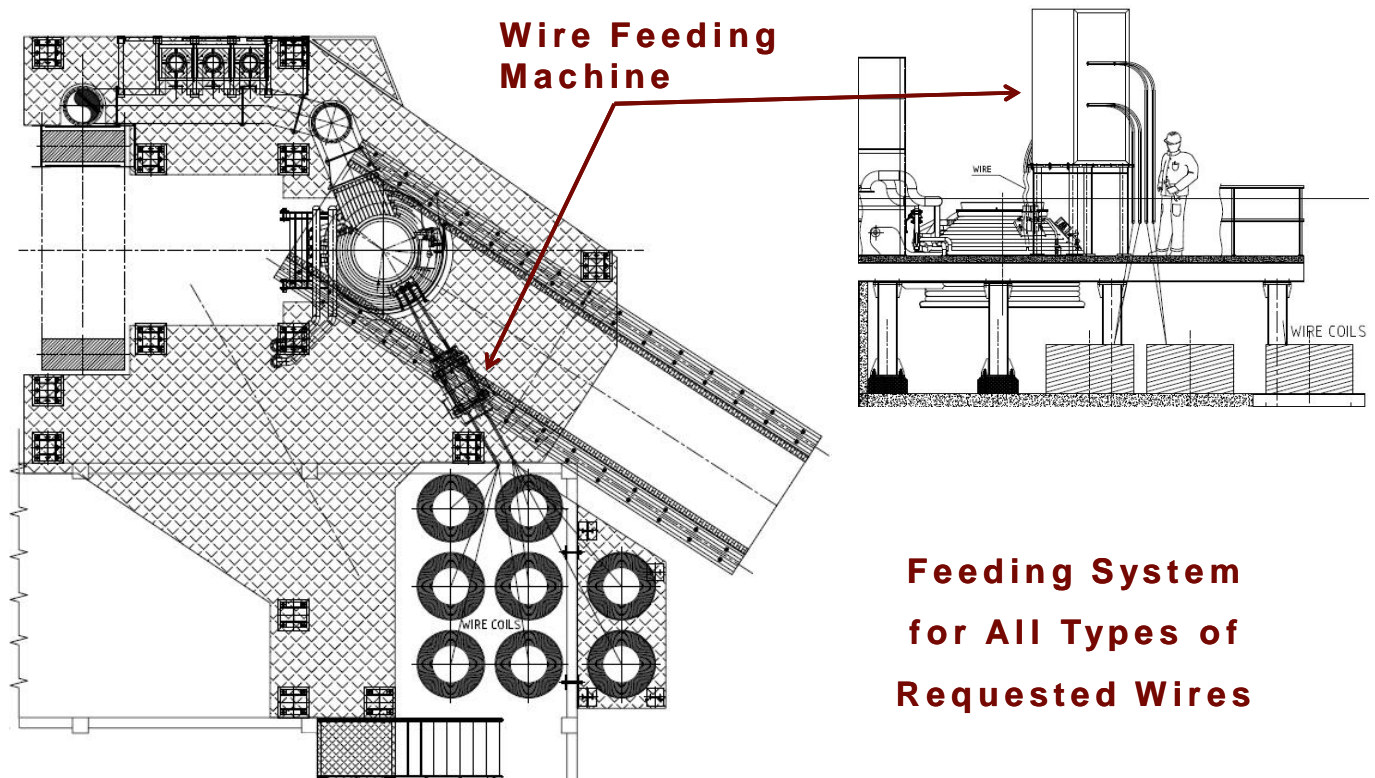


**Different Types of Conveyors**

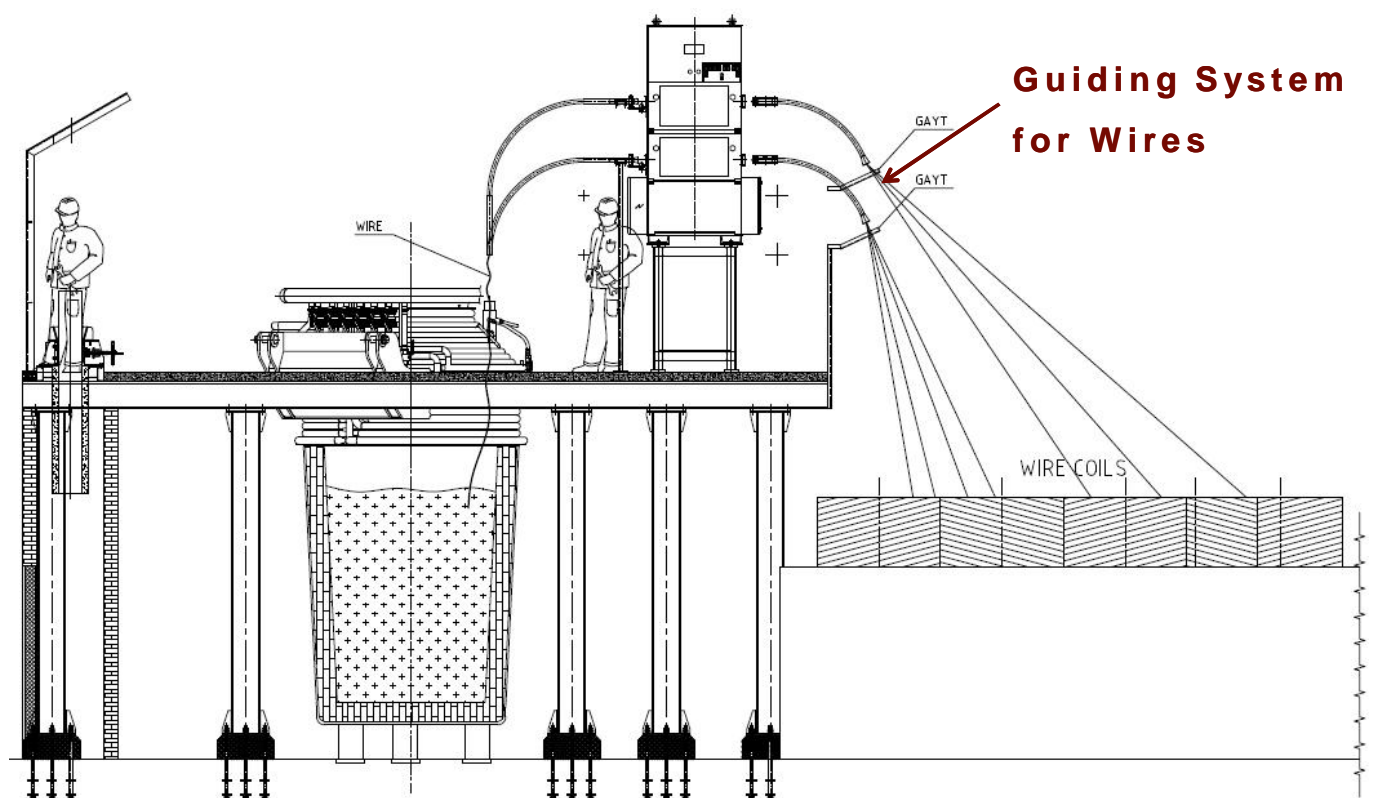




## WIRE FEEDING MACHINE



## WIRE FEEDING SIDE VIEW





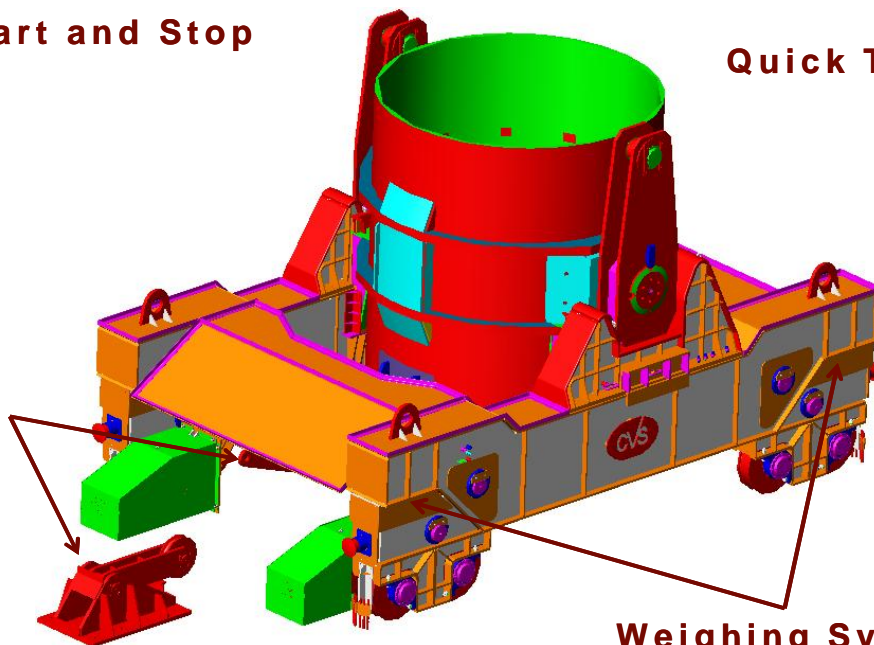
## LADLE CAR



**Smooth Start and Stop**

**Quick Transfer**

**Reel to  
Move Ladle  
Car In  
Emergency  
Situations**

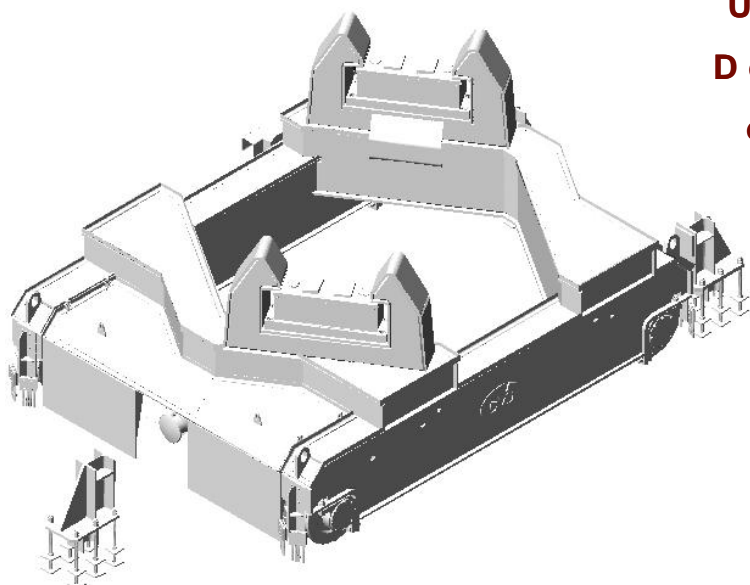


**Weighing System**

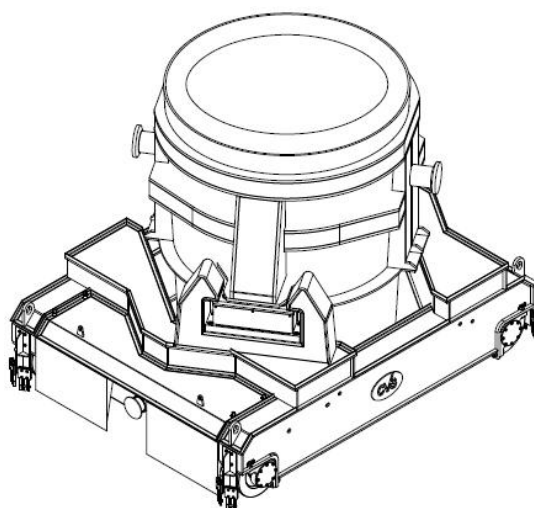
## LADLE CAR



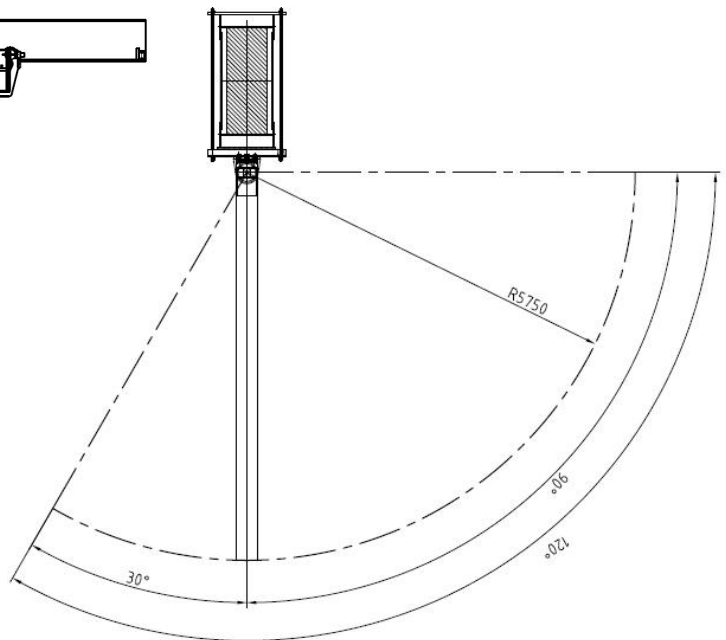
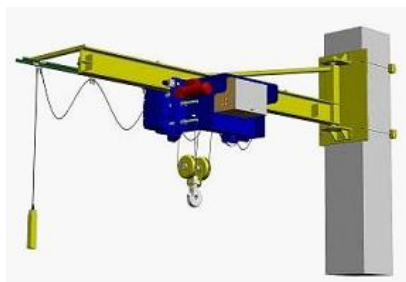
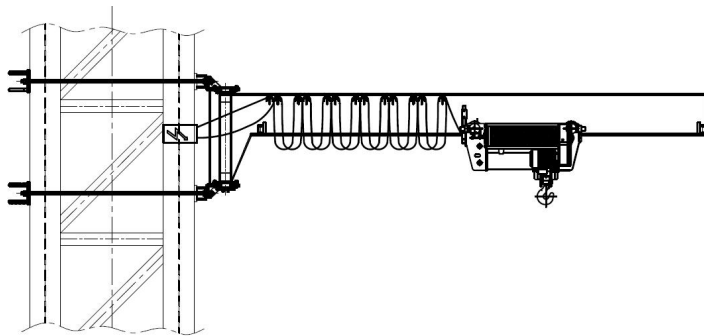
**Unique and Suitable  
Designs for Any Kind  
of Customer Needs**



**For All Capacities**



## JIB CRANE

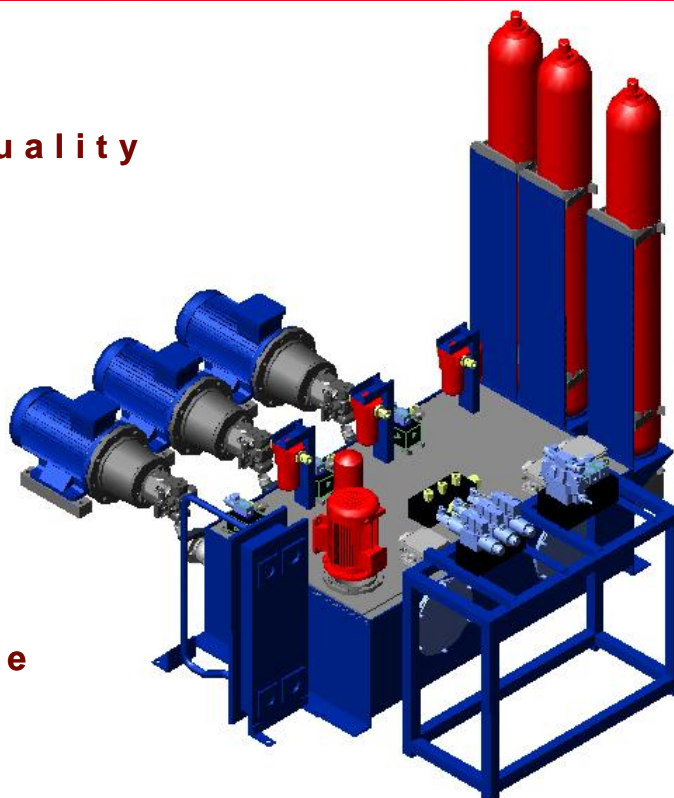


## HYRAULIC UNIT



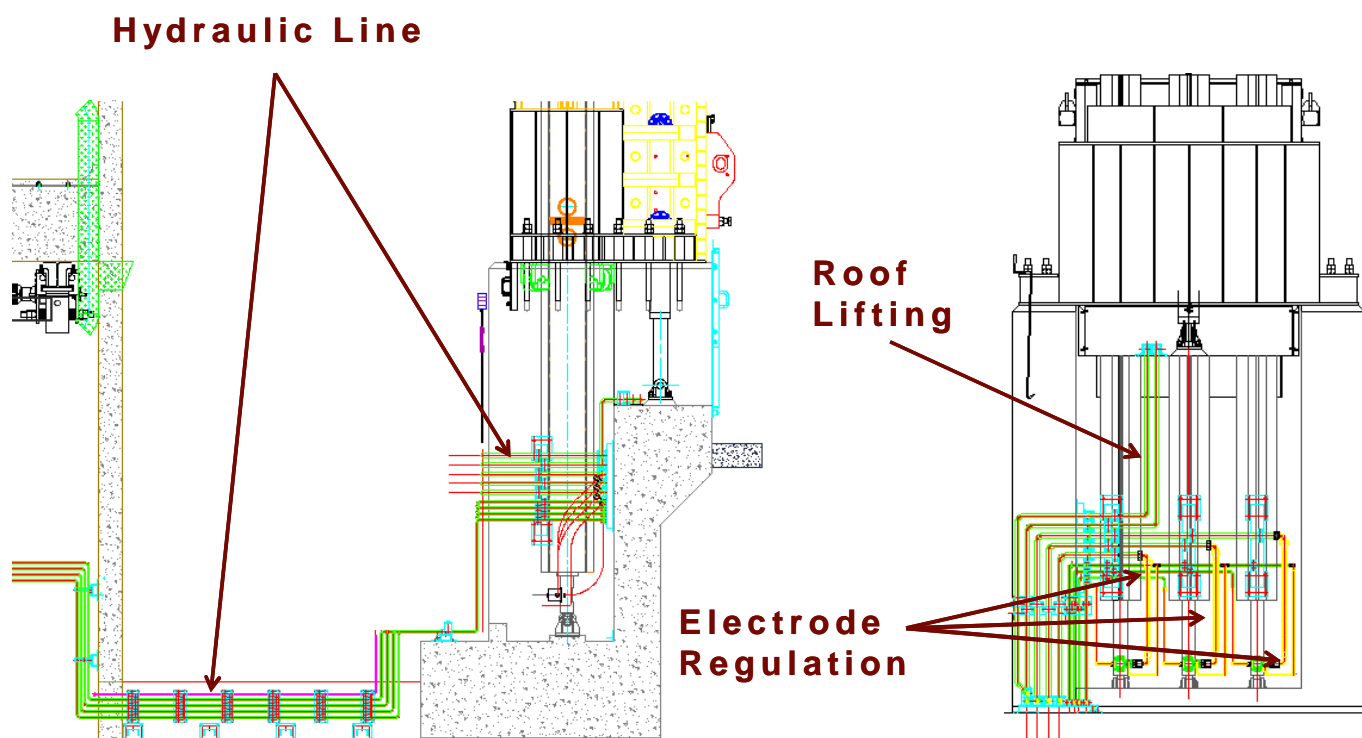
**High Quality**

**Long Life**

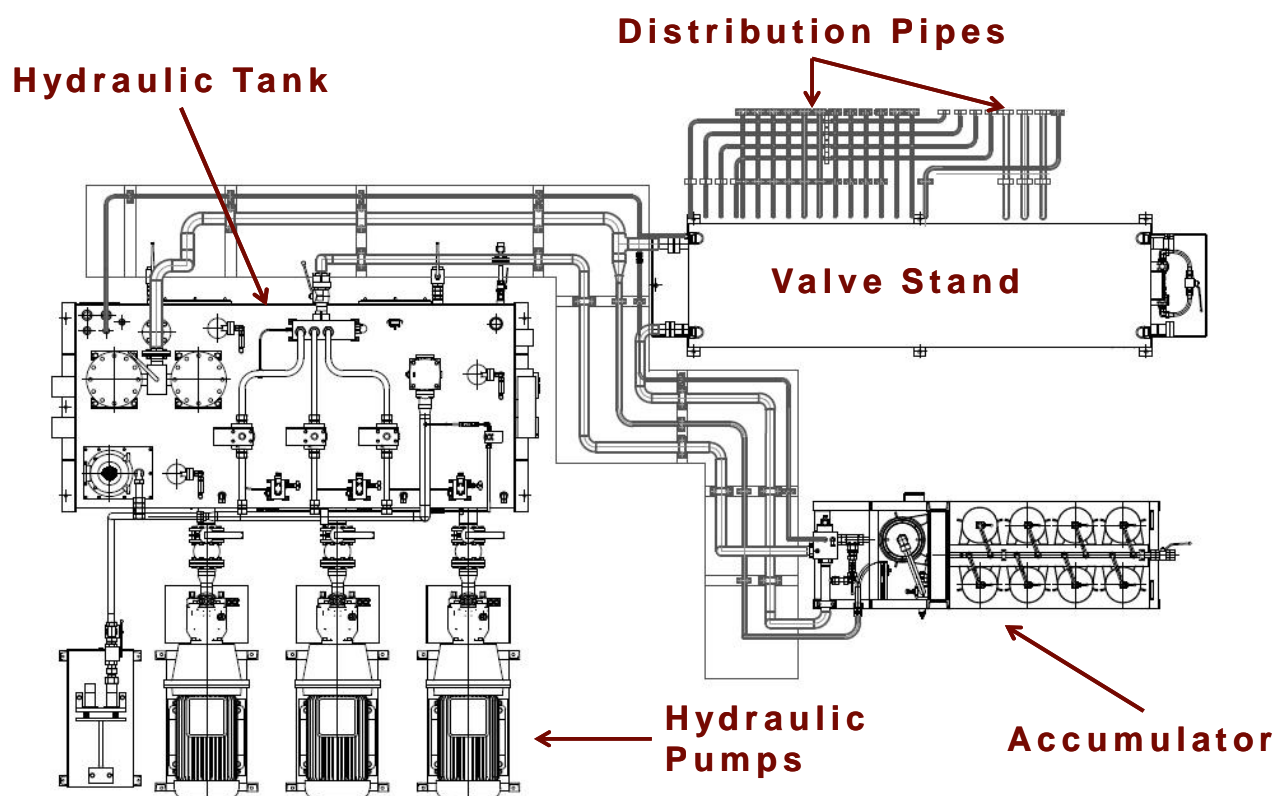


**High  
Performance**

## HYRAULIC UNIT

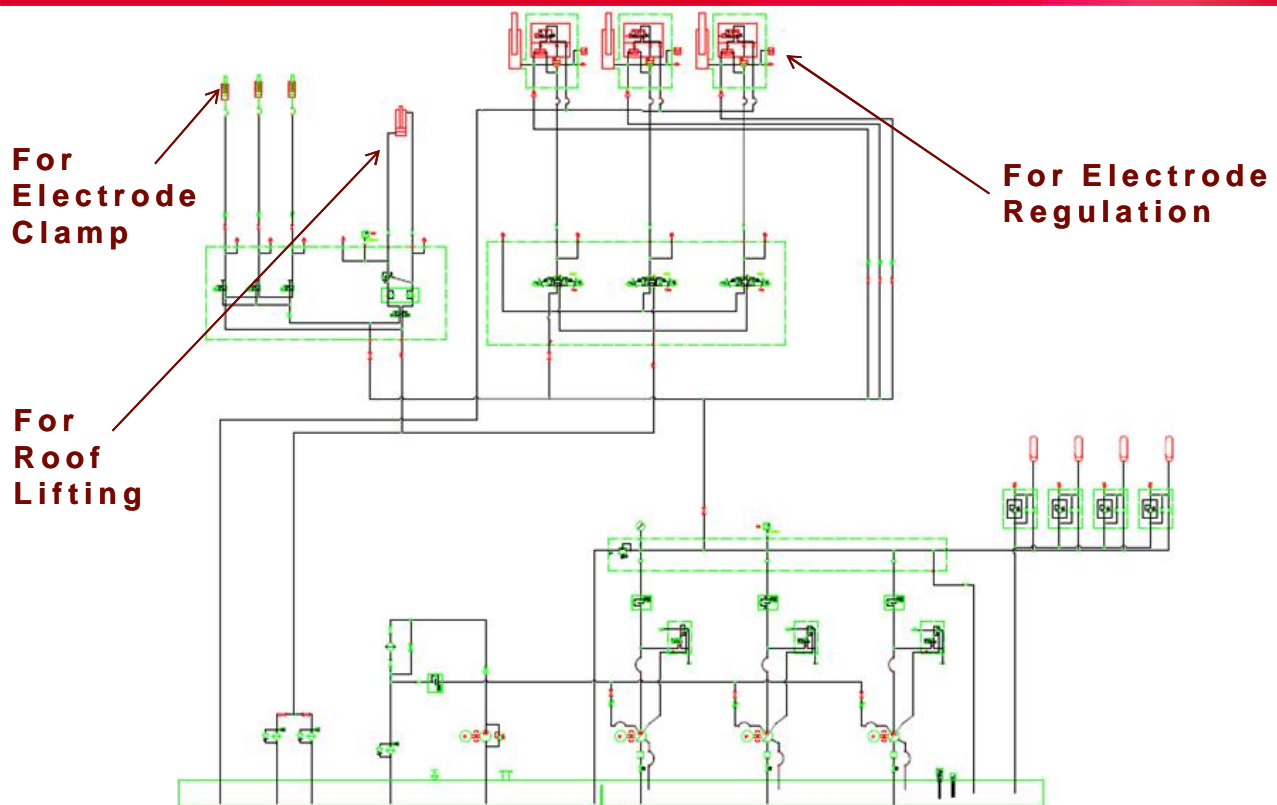


## HYRAULIC UNIT





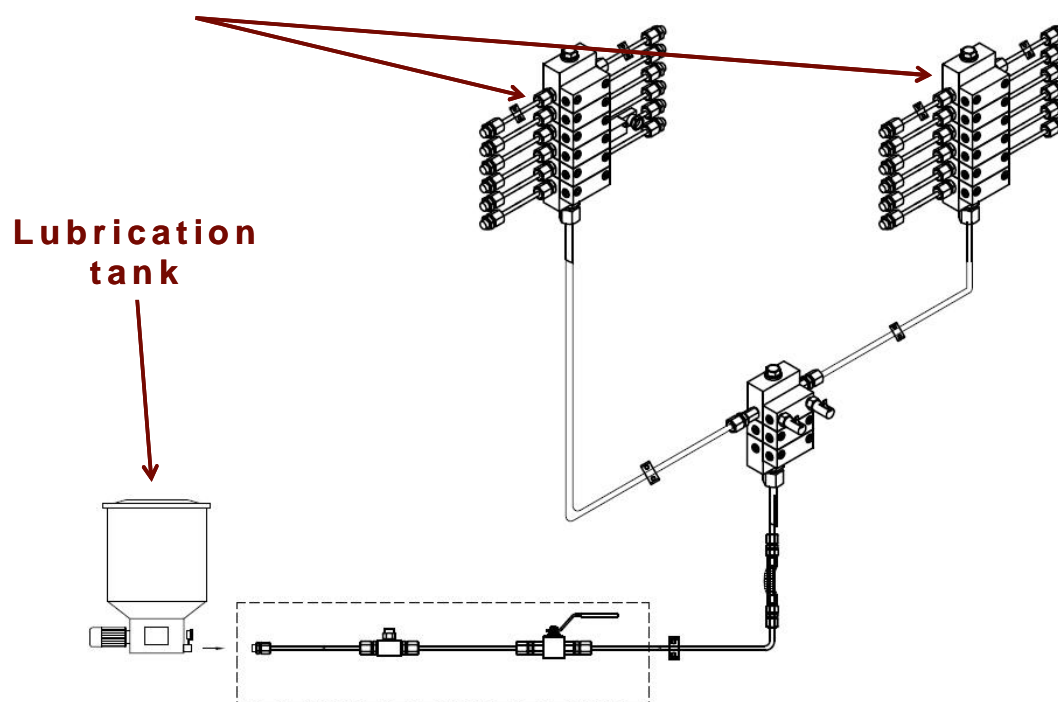
## HYRAULIC UNIT - P&I



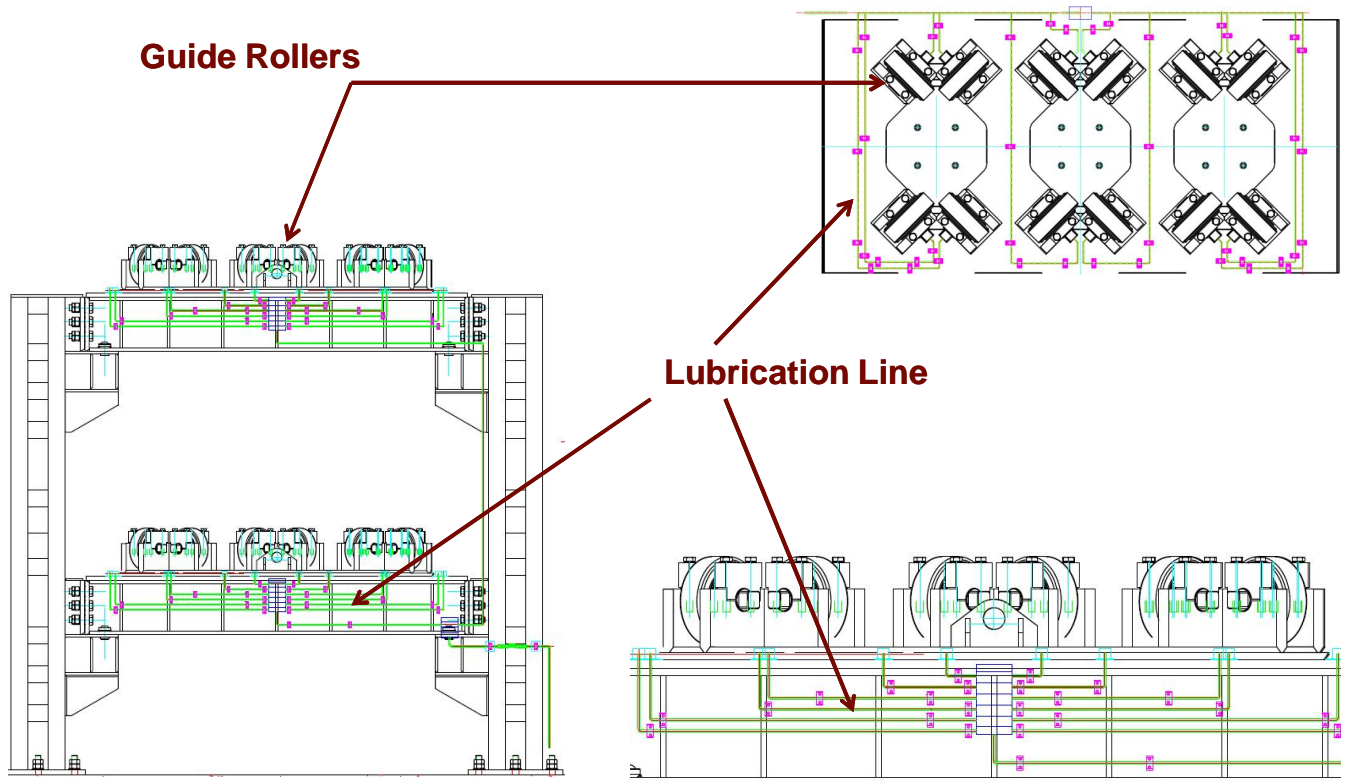
## LUBRICATION SYSTEM



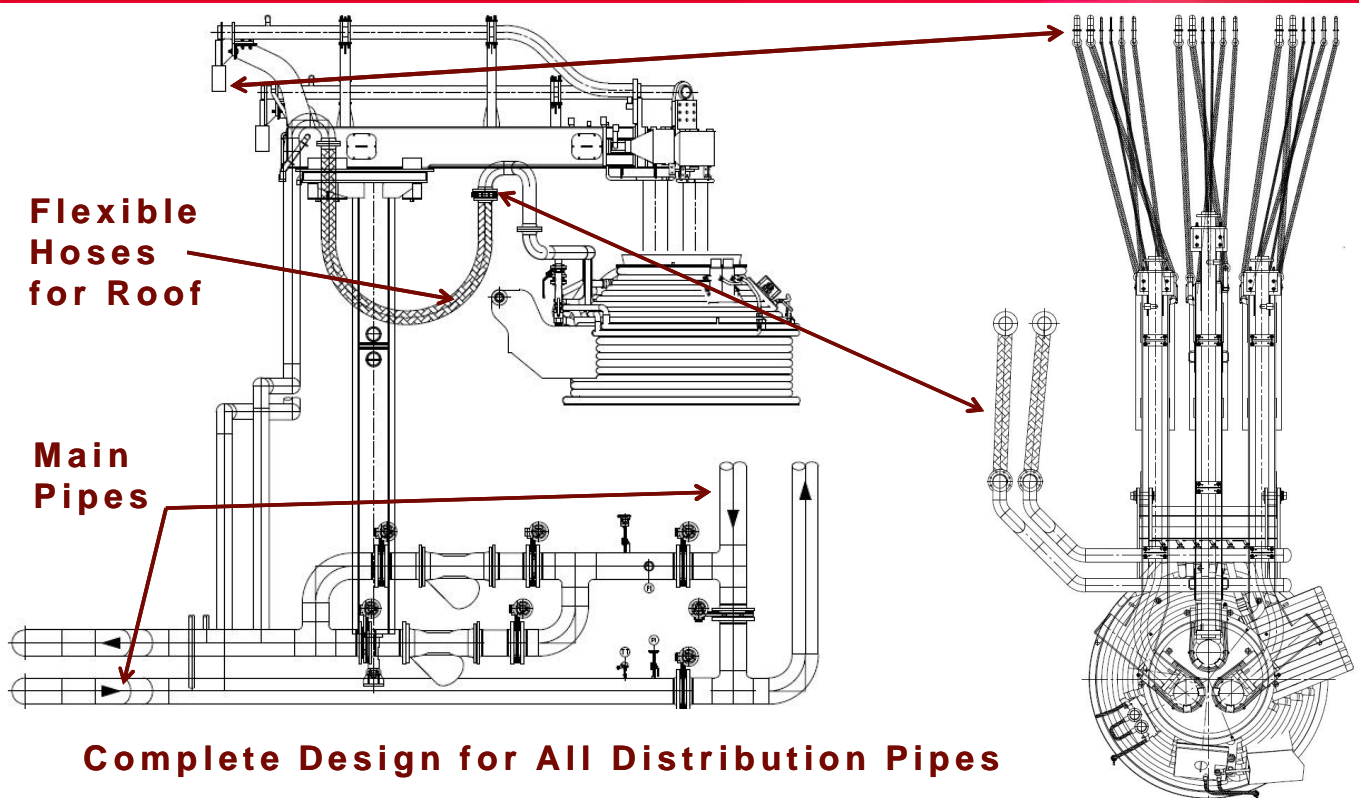
### Lubrication Distributors



## LUBRICATION SYSTEM



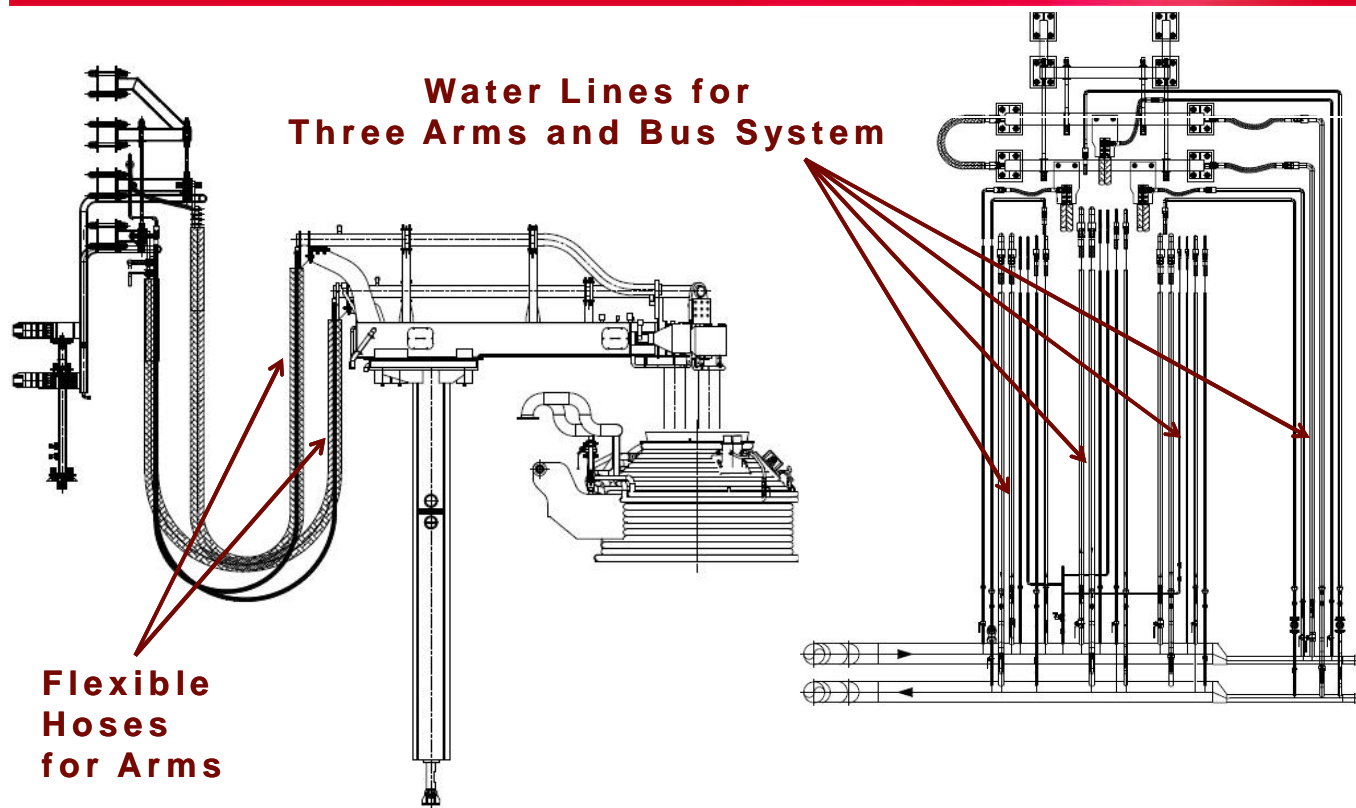
## COOLING WATER



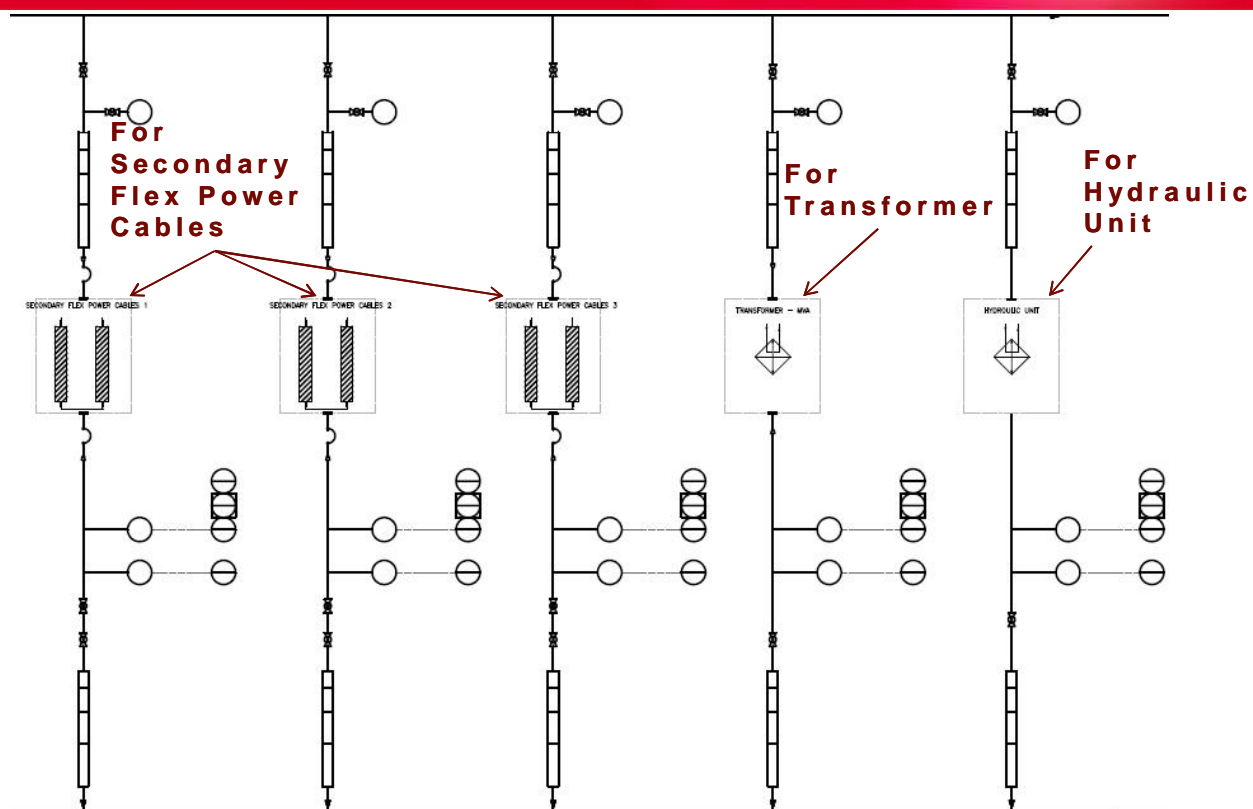
## COOLING WATER



### Water Lines for Three Arms and Bus System

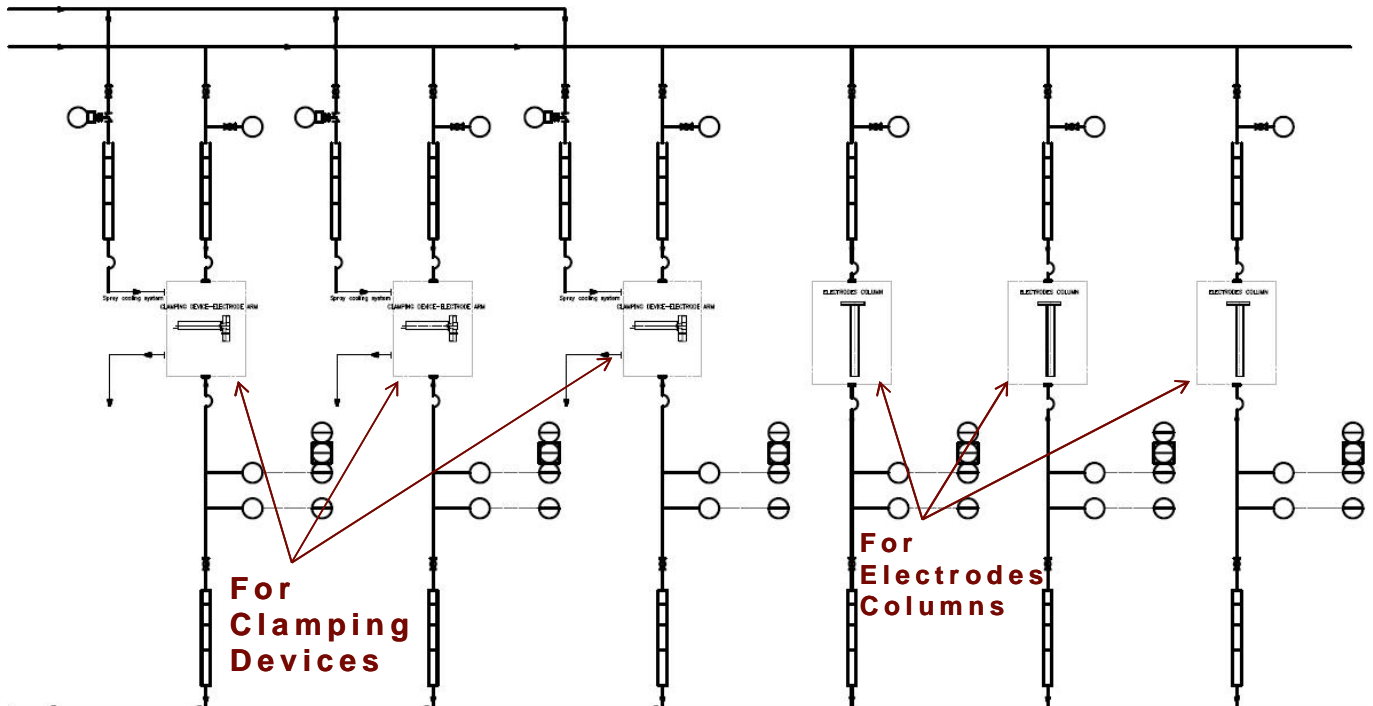


## COOLING WATER - P&I

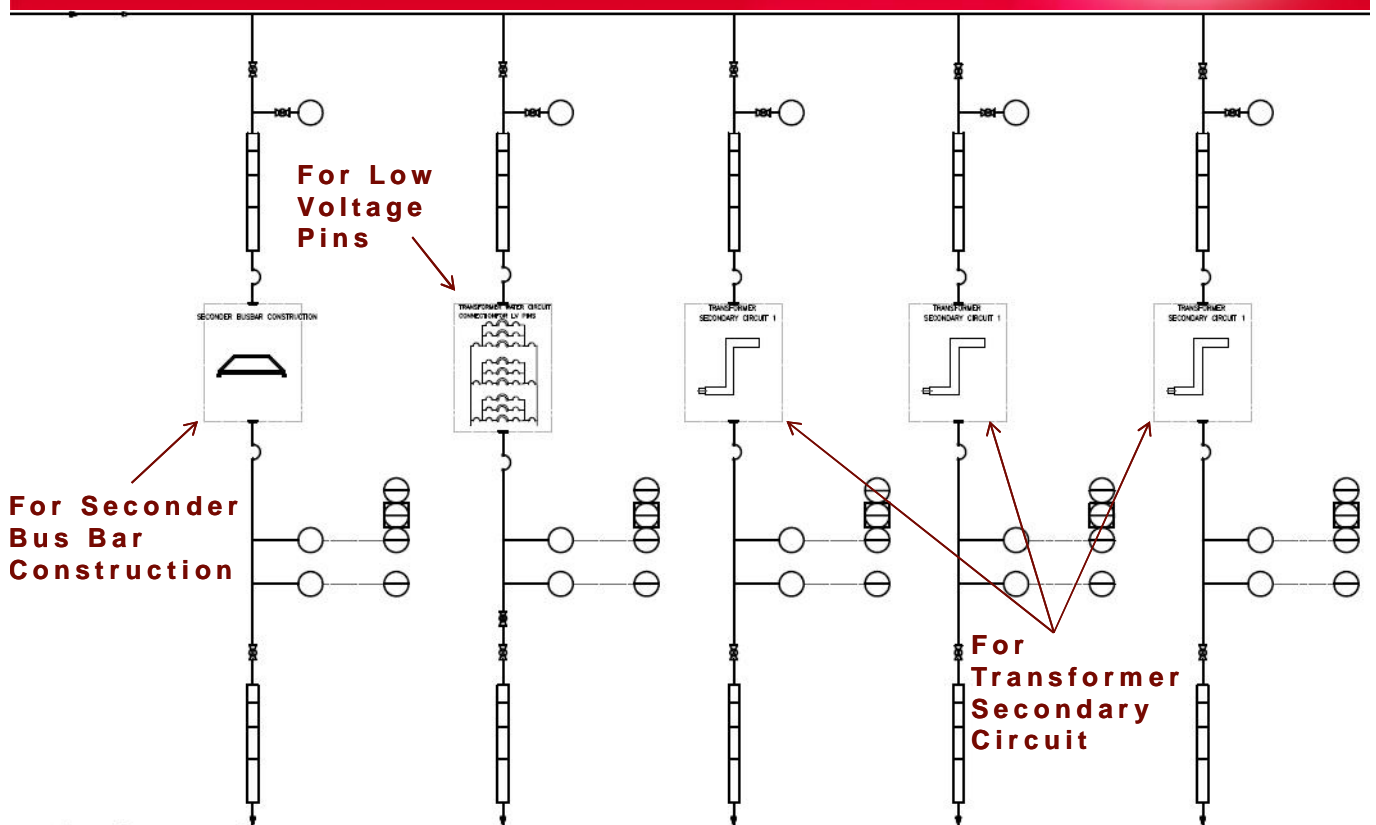




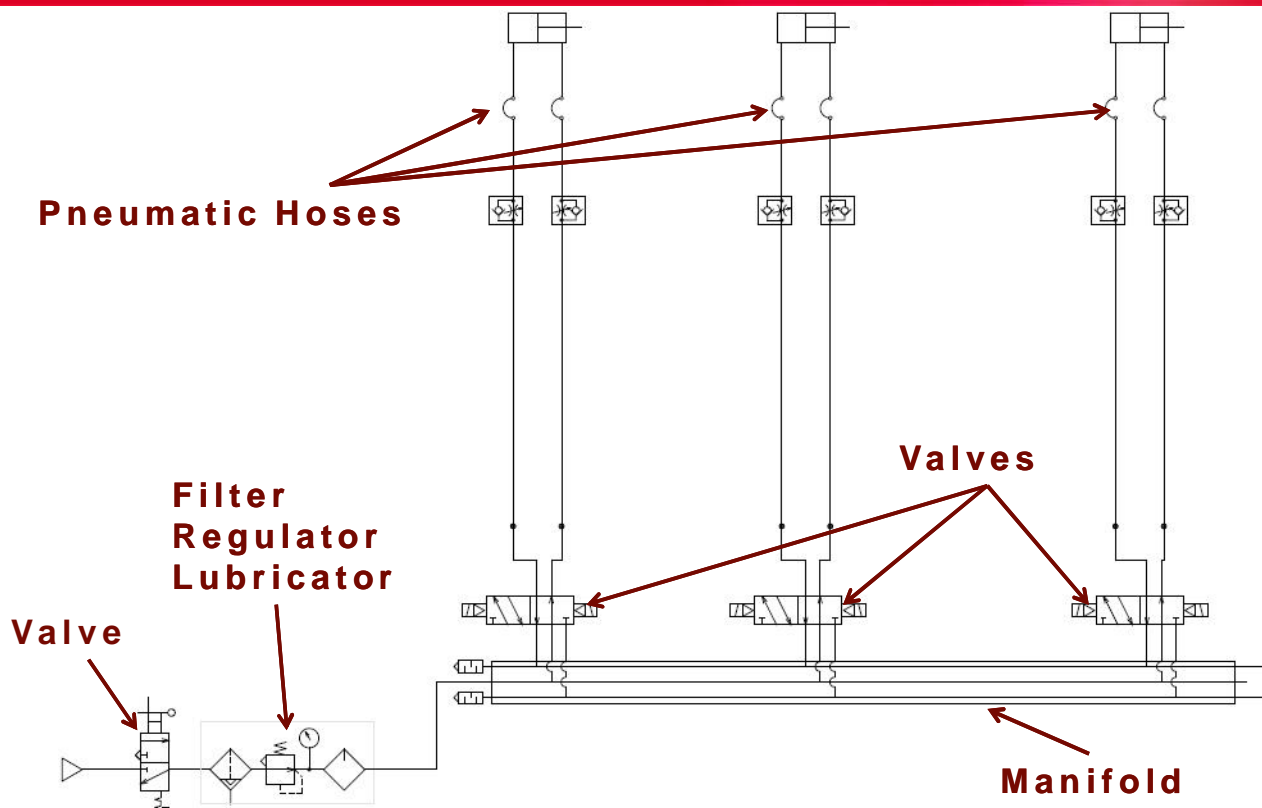
## COOLING WATER - P&I



## COOLING WATER - P&I



## COMPRESSED AIR - P&I



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