

# CITIC HEAVY INDUSTRIES PROJECT



**MAAG SH1200  
ELECTRICAL & MECHANICAL  
UPGRADE**

# Introduction



One focus for CNC Design has been the gear industry with our CNC retrofit solutions for gear shaping, grinding, cutting, gashing and measuring. Our customer base is global and includes Australia, USA, Europe, South Africa, Japan and China.

Our MAAGCut electrical & mechanical CNC conversion package for MAAG Gear Shapers is well proven with more than fifteen installations on MAAG SH machines around the world. These include MAAG models SH250, SH450, SH600 and SH1200 . These machines are used for cutting very large gears and pinions.

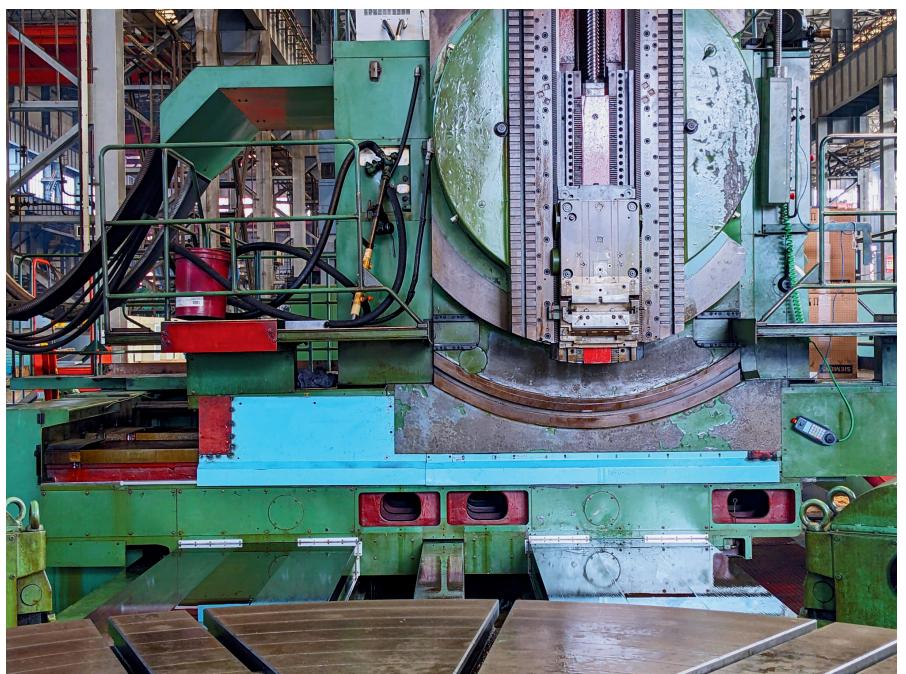
# The Customer



CITIC Heavy Industries Co. Ltd. (CITIC HIC) is a leading manufacturer of heavy-duty equipment with over 60 years of innovation and development. As a nationally and internationally recognized high-tech enterprise, it operates one of the largest manufacturing facilities globally and supports projects both in China and overseas. CITIC HIC maintains advanced R&D capabilities, including a special robot industrialization base, and holds multiple national technology and innovation certifications. With a strong global presence through overseas offices and service bases, the company implements international standards to ensure high quality and reliability. Committed to sustainable growth and continuous improvement, CITIC HIC aims to be the preferred global equipment manufacturer known for quality, innovation, and operational excellence.

The MAAG SH1200 located at CITIC is used for cutting gears up to 12m diameter.

# MAAGCut Control System with Drives & Motors



Machine modifications involved removing most of the worn & difficult to source mechanical and electrical parts and conversion to a CNC machine. The result is a reliable machine which can run for the next 10~15 years. We also added gear measuring.

## CNC Design's system includes:

- MAAGCut Software for gear shaping
- Siemens SINUMERIK ONE CNC system
- SINAMICS S120 Drives & SIMOTICS Motors
- Electrical Cabinets, Operator Console and Machine Wiring
- New Ballscrews, gearboxes and torque motors.
- New axis measuring linear scales.
- Gear measuring probe.
- Rotary scale for rotary table direct measurement.
- Engineering, Installation, Commissioning, Training & Support



# MAAG Gear cutting CNC operating software



CNC Design's MAAGCut CNC operating software has been developed and proven on a large number of MAAG machines worldwide. It offers many significant improvements in machine set up and cutting, compared with the existing system. Utilising a CNC allows us to eliminate both the old electrical control system and also most of the interlinking gears and shafts. This greatly simplifies the machine and eliminates most of the difficult to get service items, ensuring your MAAG will be supported for many more years to come.

There is no need for detailed programming the CNC control for the MAAG machine as everything is parametrised by the operator based on gear geometry.

Conversion to CNC makes it easier to train new operators.

# SINUMERIK ONE CNC System

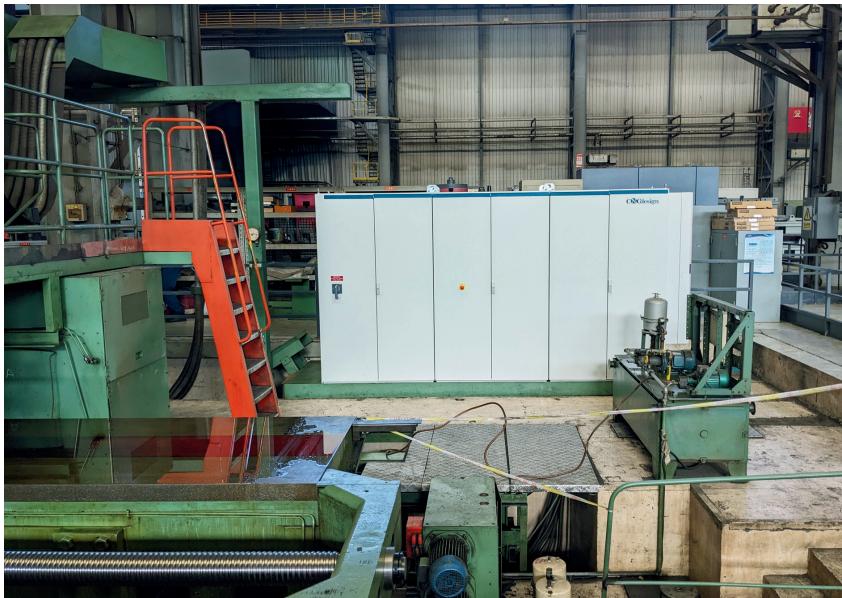


The MAAGCut solution uses the latest Siemens CNC, SINUMERIK ONE, the flagship control in the Siemens CNC portfolio. SINAMICS S120 digital drives with SIMOTICS servo, spindle & torque motors are used for all axes including the cutting head. The SINUMERIK ONE includes an integrated S7-1500F Safety PLC which can control all machine auxiliary functions.



# Operator Panel & Electrical Cabinets

As part of the project scope a new set of electrical cabinets was provided including new switchgear and air conditioner. The main operating panel was redesigned to suit the new operating concept of the machine and organised around standard SINUMERIK operating devices with 15" Operator Panel & Machine Control Panel.



The machine wiring was inspected and re-used where suitable. New cables were supplied for motor power & encoders, axis measuring systems and operator console.

# MAAGCut Features & Benefits

While not making any changes on the basic principle of gear generating as designed by the machine manufacturer, this retrofit will significantly reduce the complexity of the current machine set up and machine usability.



- The cutting strategies and cutting programs are predefined in various cycles, which we have developed with the input of industry leaders using MAAG gear shapers. The actual CNC programming code is not required to be modified by the operator and is part of CNC Design Pty Ltd Intellectual Property.
- Operation of this machine is simple. All process data are entered into setup or operation screens, it can then be recalled from memory, or entered new, when the same job is repeated.
- Machining data can also be modified dynamically during machine operation. All information will be checked for correctness and a comprehensive operator guide and logical checks accompany these inputs.
- New features designed for simplifying the operator's tasks for setup, cutting monitor and measuring are provided.

# CLIENT FEEDBACK



*“It is gratifying that the stability and accuracy of the machine are very good, and our company has given high praise to this project.”*

## MR. XU YUAN

LEADER OF TECHNICAL TEAM OF MAINTENANCE DEPARTMENT  
CITIC HEAVY INDUSTRIES CO.,LTD.



# Why CNC Design?



CNC Design is an Australian company established in 1984 with core competencies in Machine Tools, Production Machinery and associated Motion Control products. With more than 160 people located in our offices in Australia, New Zealand and SE Asia, we have been the exclusive Siemens distributor in this region for their Machine Tool Systems products and services for more than 40 years. CNC Design has experience working with our customers to develop solutions tailored to their applications with more than 3,000 projects completed in over thirty countries.



# THANK YOU



Our technicians are by your side all over the world



Upgrades &  
Retrofitting



On-site  
Support



Installation



Spare  
Parts



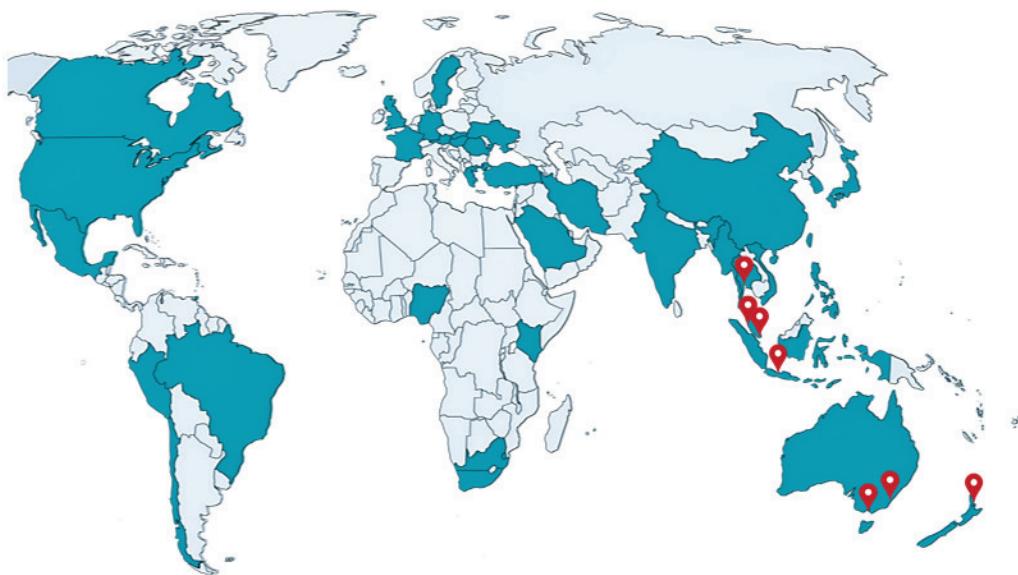
Maintenance



Training



Remote  
Customer  
Care (RCC)



CNC Design Pty. Ltd.  
Melbourne, Sydney, Australia  
Established 1984



CNC Design Ltd.  
Auckland, New Zealand,  
Established 1989



PT CNC Disain Nusantara  
Jakarta, Surabaya, Indonesia,  
Established 1996



CNC Design Co. Ltd.  
Bangkok, Thailand,  
Established 2000



CNC Design Sdn. Bhd.  
Kuala Lumpur, Johor Bahru, Malaysia,  
Established 2003



CNC Design Pte. Ltd.  
Singapore,  
Established 2009

