CAREER EPISODE 1

Revamping of 80T DC Electric Arc Furnace with Shaft technology

A) Introduction

[CE 1.1]

Title:Revamping of 80T DC Electric Arc Furnace with Shaft Technology

Duration: 15 May 2013 to 4 August 2013

Location: Singapore

Organization: Natsteel Holdings Pte Ltd, Singapore.

Position: Project Engineer

B) Background

[CE 1.2]

NatSteel traces its lineage to 1961 when it was incorporated as National Iron and Steel Mills. A pioneer and key partner in Singapore's nation-building efforts, our products are used in most construction projects island-wide, from the iconic Changi International Airport to the public housing that is the trademark of Singapore's landscape.Singapore is home to NatSteel's headquarters as well as its flagship plant, which boasts one of the largest single downstream rebar fabrication operations in the world. The Singapore plant is the only local steel mill with an integrated upstream and downstream operation, where steel is manufactured through recycling scrap, and fabricated according to customers' needs. Our subsidiary, NatSteel Recycling, is also Singapore's largest metal recycler.While typical steel mills operating electric arc furnaces use about 400 to 450 kilowatt hours of energy to produce a tonne of steel, NatSteel does the same consuming 30% less energy As the only steel mill in Singapore, NatSteel uses 100% recycled metal scrap that undergoes stringent

radiation checks. This ensures the delivery of premium, high-quality reinforcement steel solutions that are sustainable and safe.

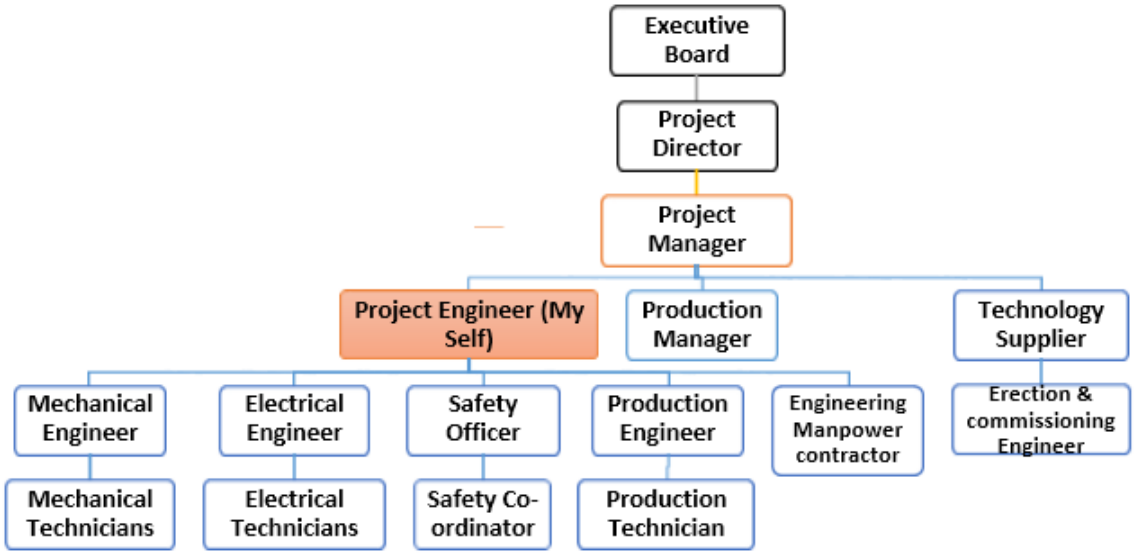
[CE 1.3]

The main objective of the upgrade was to increase productivity from 2400 tons/ per day of steel produced to 2560 ton/per day, thus increasing the output from 750K to 800K tpa. Having a net saving of $1.1M/year.Reduce the unplanned downtime of the equipment from 9% per month to 6%. Reduce maintenance cost from $11/mt to $9/mt resulting in a cost saving of $1.4M/year. Increase hot charge of steel billets produced for Merchant Bar Mill (MBM) by 2.5%, thereby increasing reheating furnace capacity from 90 tph to 120 tph as well as reducing fuel consumption from 24 lit/mt to 12 lit/mt resulting in a saving of $216K/year (value based on $0.90/lit in 2013)

[CE 1.4]

I worked on improving the safety of the operators during inspection after every batch of steel produced by redesigning the furnace tapping position from RBT (Round Bottom Tapping) to EBT (Eccentric Bottom Tapping). I worked on enhancing the heat recovery from the furnace, which helps in pre-heating the scrap inside the shaft and thus reducing the total power consumption from 280kwh/mt to 275kwh/mt.

[CE 1.5]



[CE 1.6] Duties:

- I conducted the feasibility study for projects covering availability and reliability improvement and new equipment installation.
- I did the preparation of the project schedule, and resource management (equipment, tools, and manpower).
- I drove health and safety, commercial outcomes, procurement, engineering, and

people management across maintenance projects.

- I coordinated the preparation of cost estimates, tender submissions, technical documentation, and client reports and monitored project progress and resourcing.
- I conducted the design and engineering reviews and owned the execution and delivery of the projects.
- I monitored site progress as well as ensured the project meets legislative and health and safety requirements.
- I managed the complete cycle of production and energy improvement projects from inception to commissioning.
- I supervised and inspected the installation, commissioning, and modification of equipment while executing CAPEX projects.
- I conducted the safe operating procedure and risk assessments and supervised the technicians.
- I conducted weekly project progress updates and reporting.

C) Personal Engineering Activity

[CE 1.7]

There was an issue during the equipment erection where the datum reference was different in the engineering drawing compared to the actual site condition. The entire fabrication of the equipment was performed based on the old engineering drawings whereas modification made during the midlife was not taken into consideration., as a result, the entire equipment was elevated by 50mm, which was causing a hindrance when the scrap was charged.

- The overhead crane lifting position limit switch was adjusted which gave us some tolerance and the crane lifting hooks were modified to adapt to the new height which solved the issue.

At the beginning of the project, the total workforce required to complete the entire project was estimated to be 80 people working on 2 shifts, this resulted in a delay during the 1st week. The number of people was more than required and since the project was carried out within a building space, a few of the men were underutilized due to constrain in space. The entire schedule was delayed by 2 days after 1 week. So a decision was made to split the entire workforce to perform 3 shifts with only 20 people working per shift. This resulted in increased productivity as the entire team got enough time to rest (as they do not have to work long hours) and the entire project was completed 2 days in advance of the original schedule.

[CE 1.8]

I was assigned to conduct a feasibility study to assess the viability and potential benefits of implementing availability and reliability improvement measures, as well as installing new equipment in our organization. The study aimed to evaluate the technical, financial, and operational aspects of these projects and determine their feasibility.To carry out the feasibility study, I followed a systematic3

approach. Firstly, I defined the scope of the projects, identifying the areas in need of improvement and selecting the specific equipment to be installed. I collected relevant data on the current availability and reliability levels, equipment performance, maintenance costs, and operational requirements. I also gathered information on the proposed new equipment, including its specifications, costs, and expected benefits.A thorough technical evaluation was conducted on the existing systems and equipment. This involved analyzing historical data, conducting inspections, and consulting with subject matter experts to identify potential causes of downtime, reliability issues, and areas for improvement. Additionally, I assessed the compatibility and integration of the new equipment with the existing infrastructure.A comprehensive financial analysis was performed to assess the costs and benefits associated with the proposed projects. This included estimating the initial investment required for new equipment installation and evaluating the projected cost savings resulting from increased availability and reliability. Factors such as maintenance and operational costs, potential revenue increases, and the expected return on investment were also considered.

[CE 1.9]

In order to identify and evaluate potential risks or uncertainties associated with the implementation of these projects, a risk assessment was conducted. This involved assessing the impact of project delays, cost overruns, technical challenges, and any potential disruptions to operations.Based on the findings from the technical evaluation, financial analysis, and risk assessment, I determined that the implementation of availability and reliability improvement measures, along with the installation of new equipment, is both technically and financially feasible. The projects have the potential to significantly improve availability and reliability, reduce downtime, and increase operational efficiency. The projected cost savings resulting from reduced maintenance, decreased downtime, and improved operational efficiency outweigh the initial investment and ongoing operational costs. Additionally, the new equipment installation will enable us to leverage advanced technologies and capabilities, leading to enhanced performance and productivity.

[CE 1.10]

During the execution of CAPEX projects, I took on the responsibility of supervising and inspecting the installation, commissioning, and modification of equipment. I ensured that all activities were carried out in accordance with the designated procedures and standards. This involved closely monitoring the progress of the projects and conducting regular inspections to verify the proper installation and functioning of the equipment. Any necessary modifications were identified and addressed promptly to ensure optimal performance.As part of my role, I conducted thorough safe operating procedure reviews and risk assessments for each project. This involved assessing potential hazards and risks associated with the installation and operation of the equipment. I worked closely with technicians and other team members to develop and implement effective risk mitigation strategies.

[CE 1.11]

Throughout the projects, I provided guidance and supervision to the technicians, ensuring they followed the established safe operating procedures and maintained a safe working environment.By actively supervising and inspecting the installation, commissioning, and modification of equipment, as well as conducting safe operating procedure reviews and risk assessments, I contributed to the successful and safe execution of the CAPEX projects. The collaborative efforts of the team, along with my oversight, ensured that the projects were completed efficiently while adhering to the highest safety standards.

The DC-EAF shaft furnace at NatSteel is shown below:

[CE 1.12]

While there are inherent risks associated with these projects, adequate risk mitigation measures can be implemented to minimize their impact on operations. Therefore, I recommend moving forward with the implementation of the availability and reliability improvement measures and the installation of new equipment. Developing a detailed project plan, including a timeline, budget, and resource allocation, will be crucial for successful execution.

D) Summary

[CE 1.13]

In conclusion, the feasibility study has demonstrated the potential benefits and viability of implementing availability and reliability improvement measures, as well as installing new equipment.

[CE 1.14]

These projects are technically and financially feasible and hold the potential to significantly enhance our operational performance. By implementing the recommended projects and closely5

monitoring their progress, I worked towards achieving improved availability, reliability, and efficiency in our organization.

[CE 1.15]

The design and engineering reviews were conducted and linked with the project execution and delivery. I continuously monitored the site's progress and ensured the project met the legislative and health and safety requirements.

CAREER EPISODE 2

Revamping EAF Slag Pit

A) Introduction

[CE 2.1]

Title: Revamping EAF Slag Pit

Duration: February 2015 – 14 days

Location: Singapore

Organization:Natsteel Holdings Pte Ltd, Singapore.

Position: Lead Project Engineer

B) Background

[CE 2.2]

NatSteel traces its lineage to 1961 when it was incorporated as National Iron and Steel Mills. A pioneer and key partner in Singapore's nation-building efforts, our products are used in most construction projects island-wide, from the iconic Changi International Airport to the public housing that is the trademark of Singapore's landscape.Singapore is home to NatSteel's headquarters as well as its flagship plant, which boasts one of the largest single downstream rebar fabrication operations in the world. The Singapore plant is the only local steel mill with an integrated upstream and downstream operation, where steel is manufactured through recycling scrap, and fabricated according to

customers' needs. Our subsidiary, NatSteel Recycling, is also Singapore's largest metal recycler.While typical steel mills operating electric arc furnaces use about 400 to 450 kilowatt hours of energy to produce a tonne of steel, NatSteel does the same consuming 30% less energy As the only steel mill in Singapore, NatSteel uses 100% recycled metal scrap that undergoes stringent radiation checks. This ensures the delivery of premium, high-quality reinforcement steel solutions that are sustainable and safe.Natsteel produces about 2560 mt of steel, every day with about 7-10% as slag which are the impurities that come from the scrap. This slag is further processed and used as the main product for road making.

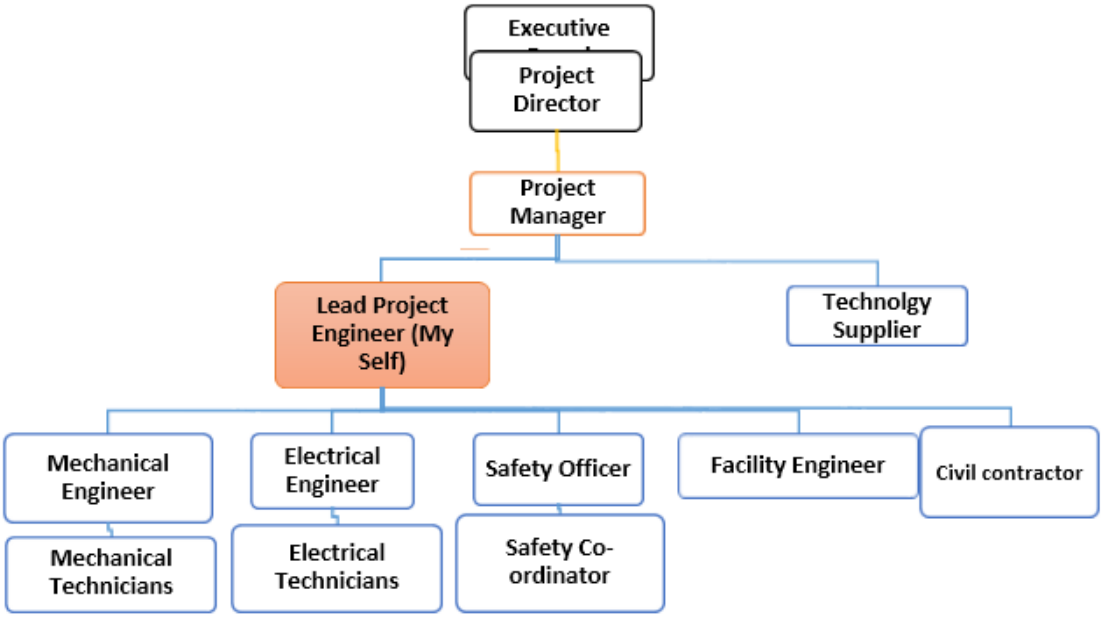
[CE 2.3]

The main objective of the project was to improve the safety condition of the EAF slag pit as water flows into the slag pit which possess a safety concern during the slag removal process.To regulate the amount of water sprayed using an automated system to avoid excess usage, as manual spraying using a hose was not effective as excess water sprayed into the slag pit possess a safety risk and less water sprayed increases the time taken for cooling the slag and removal process.

[CE 2.4]

To address the issues with excess water usage and safety risks in the slag pit, I implemented an automated system to regulate the amount of water sprayed. The previous manual spraying method using a hose proved to be ineffective as it resulted in the excessive spraying of water. This posed safety risks and also prolonged the cooling and removal process of the slag.

[CE 2.5]



[CE 2.6]Duties:

- I conducted the feasibility study for projects covering availability and reliability improvement.
- I did the preparation of project schedule, and resource management (equipment, tools, and manpower).
- I worked on driving health and safety, commercial outcomes, procurement, engineering, and people management across the improvement project.
- I coordinated the preparation of cost estimates, tender submissions, technical documentation, and client reports and monitored project progress and resourcing.
- I conducted design and engineering reviews and owned the execution and delivery of the projects.
- I monitored the site progress as well as ensured the project meets legislative and health and safety requirements.
- I managed the complete cycle of production and energy improvement projects from inception to commissioning.

C) Personal Engineering Activity

[CE 2.7]

I supervised and inspected the installation, commissioning, and modification of equipment while executing the capex project.I conducted safe operating procedures and risk assessments and supervised the technicians.I conducted weekly project progress updates and reporting. Since the project was scheduled during the Chinese New Year period in the Year 2015 and was a Public holiday period, it was quite difficult to arrange the necessary resources like concrete. This eventually was foreseen to create a delay in the overall project startup, hence a decision was made to pay extra for the few days to the concrete company to supply the necessary concrete grade. In the end, we were able to complete the project 1.5 days ahead of schedule. The extra cost paid to the concrete company was negligible compared to an additional day of operation output. In order to overcome these challenges, I took the initiative to install an automated system that would control the water spraying process.

[CE 2.8]

This system allowed for precise control and adjustment of the water flow, ensuring that only the required amount of water was sprayed onto the slag. By avoiding excess water usage, I minimized the safety risks associated with overflowing water in the pit.Furthermore, the automated system enabled us to optimize the cooling and removal process. By regulating the water spray, we ensured that the slag was adequately cooled within an optimal timeframe. This not only enhanced the efficiency of the cooling process but also reduced the overall time required for slag removal.Through the implementation of the automated water spraying system, I successfully addressed the issues related to excess water usage and safety risks in the slag pit. The precise control over the water flow allowed us to strike a balance between ensuring effective cooling and maintaining a safe working environment. This improvement significantly contributed to the overall efficiency and safety[8]

of the slag cooling and removal process.As part of my responsibilities during the execution of the CAPEX project, I took on the role of supervising and inspecting the installation, commissioning, and modification of equipment. It was my duty to ensure that all these activities were carried out accurately and efficiently.

[CE 2.9]

I supervised the installation process, closely monitoring each step to ensure that the equipment was properly installed according to the specified guidelines and requirements. I conducted thorough inspections to verify the correct positioning, alignment, and connections of the equipment. If any modifications were necessary, I promptly identified them and ensured that they were implemented correctly.During the commissioning phase, I supervised the testing and calibration of the newly installed equipment. I worked closely with the technicians and engineers to ensure that all systems and components were functioning as expected. Any issues or discrepancies were addressed immediately to ensure the smooth commissioning of the equipment.Additionally, I oversaw and inspected any modifications made to the equipment during the project. I carefully assessed the feasibility and impact of the modifications, ensuring they were implemented correctly and in accordance with the project specifications. Regular inspections were conducted to ensure that the modifications met the desired objectives and complied with safety and regulatory standards.By supervising and inspecting the installation, commissioning, and modification of equipment, I played a vital role in ensuring the successful execution of the CAPEX project.

[CE 2.10]

Through my diligent oversight, I contributed to the timely completion of the project and the seamless integration of new equipment into our operations. Throughout my role, I managed the complete cycle of production and energy improvement projects, overseeing them from inception to commissioning. I took charge of the entire process, ensuring its smooth execution and successful completion.During the inception phase, I worked closely with stakeholders to identify project objectives, requirements, and desired outcomes. I conducted thorough research and analysis to develop a comprehensive project plan, considering factors such as feasibility, resource allocation, and potential risks. This involved gathering input from various departments and collaborating with cross-functional teams to align project goals with organizational objectives.Once the project plan was established, I initiated the implementation phase. I organized and coordinated the activities of different teams and external contractors involved in the project. This included overseeing procurement, resource allocation, and project scheduling to ensure timely execution. I closely monitored progress, providing guidance and support to team members, and addressing any challenges that arose along the way.Throughout the project, I maintained effective communication channels with all stakeholders, providing regular updates on project status, milestones, and any deviations from the plan. I actively resolved conflicts, managed expectations, and ensured alignment between project deliverables and stakeholder requirements.

[CE 2.11]

I carefully reviewed the installation instructions, guidelines, and technical documentation provided by the equipment manufacturer. This allowed me to gain a thorough understanding of the installation requirements and procedures. Armed with this knowledge, I closely supervised the installation team, ensuring that they followed the specified guidelines and adhered to industry best practices.I actively monitored the progress of the installation, ensuring that each step was executed correctly and in the prescribed order. I verified that all components and subsystems were installed in the appropriate locations and securely fastened. Additionally, I ensured that proper alignment and calibration procedures were followed to achieve optimal performance.Throughout the installation, I maintained open lines of communication with the installation team, providing guidance and clarification when needed. I addressed any challenges or issues that arose during the process, working collaboratively with the team to find effective solutions and maintain progress.By closely monitoring each step of the installation process, I ensured that the equipment was installed with precision and met the specified guidelines and requirements. This meticulous attention to detail helped to minimize the risk of errors or complications that could have potentially impacted the performance and functionality of the equipment.Overall, my vigilant supervision and adherence to the specified guidelines during the installation process contributed to the successful and accurate installation of the equipment. It played a vital role in ensuring that the installed equipment was properly aligned, calibrated, and ready for the subsequent stages of commissioning and operation.

[CE 2.12]

As the project approached completion, I led the commissioning phase, overseeing the final testing, adjustments, and verification of the production and energy improvement systems. I worked closely with the commissioning team to ensure that all equipment, processes, and systems were fully operational, safe, and compliant with regulations. I supervised the handover process, ensuring proper documentation and training were provided to the relevant personnel.

D) Summary

[CE 2.13]

By managing the complete cycle of production and energy improvement projects, from inception to commissioning, I successfully delivered tangible results. Through effective planning, coordination, and leadership, I ensured that projects were completed on time, within budget, and met the intended objectives. This comprehensive approach allowed for the seamless integration of improved production processes and enhanced energy efficiency within our organization.

[CE 2.14]

The complete schedule was performed using MS projects and the data were input to CCPM (critical chain project management) software to identify the critical path of the project. Concrete handling, which was taken care of by the civil contractor.

[CE 2.15]

By managing the complete cycle of production and energy improvement projects, I successfully delivered tangible outcomes for the organization. Through meticulous planning, effective coordination, and strong leadership, I ensured that projects were completed on time, within budget, and met the intended objectives. These efforts resulted in improved production processes, enhanced energy efficiency, and a positive impact on the overall operations of the organization.

CAREER EPISODE 3

Installation of Dust Netting & Doghouse for Slag Pit

A) Introduction

[CE 3.1]

Title:Installation of Dust Netting & Doghouse for Slag Pit.

Duration: July 2019 – 30 days

Location: Singapore

Organization:Natsteel Holdings Pte. Ltd, Singapore.

Position: Senior Mechanical Engineer

B) Background

[CE 3.2]

NatSteel traces its lineage to 1961 when it was incorporated as National Iron and Steel Mills. A pioneer and key partner in Singapore's nation-building efforts, our products are used in most construction projects island-wide, from the iconic Changi International Airport to the

public housing that is the trademark of Singapore's landscape.Singapore is home to NatSteel's headquarters as well as its flagship plant, which boasts one of the largest single downstream rebar fabrication operations in the world. The Singapore plant is the only local steel mill with an integrated upstream and downstream operation, where steel is manufactured through recycling scrap, and fabricated according to customers' needs. Our subsidiary, NatSteel Recycling, is also Singapore's largest metal recycler.While typical steel mills operating electric arc furnaces use about 400 to 450 kilowatt hours of energy to produce a tonne of steel, NatSteel does the same consuming 30% less energy As the only steel mill in Singapore, NatSteel uses 100% recycled metal scrap that undergoes stringent radiation checks. This ensures the delivery of premium, high-quality reinforcement steel solutions that are sustainable and safe.Natsteel produces about 2560 mt of steel, which goes through a refining process before it is cast into billets. Slag is produced during the refining process which amounts to about 1-1.5% of steel produced every day. Refining is the process where raw molten steel is converted to different steel grades based on carbon content. This slag is usually sent to authorized environmental agencies. The slag produced is very fine and hence they are soaked in a pool of water before they are transported

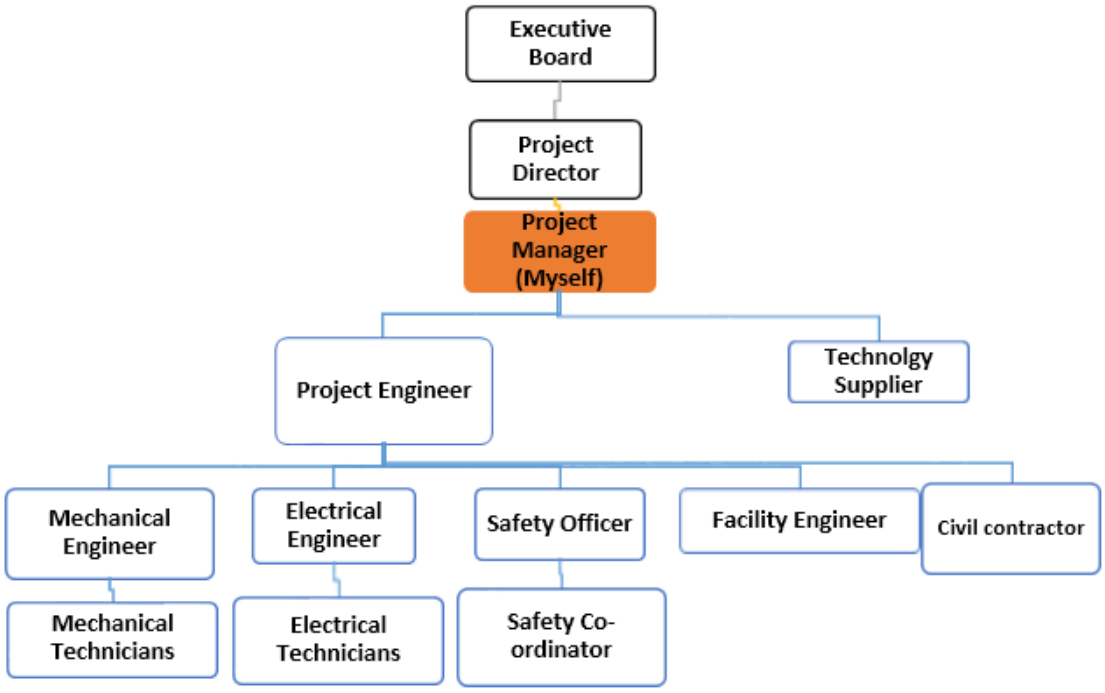
[CE 3.3]

The main objective of the project was to improve the Environmental condition of the Ladle furnace discharge slag pit.

[CE 3.4]

On a daily basis, this slag is collected from the production center using a dump truck and discharged into a pool of water; this caused an environmental hazard when the ashes fly to nearby locations during discharge. Therefore, a project team was formed to build a doghouse with a sprinkler system in-order to contain the ash and dust within the building.

[CE 3.5]



[CE 3.6] Duties:

- I reviewed the feasibility study for projects covering availability and reliability improvement.
- I did the preparation of the project schedule, resource management (equipment, tools, and manpower)
- I worked on driving health and safety, commercial outcomes, procurement, engineering, and people management across the improvement project
- I coordinated the preparation of cost estimates, tender submissions, technical documentation, and client reports and monitored project progress and resourcing
- I oversaw the design and engineering reviews and owned the execution and delivery of the projects
- I monitored the site progress as well as ensuring the project meets legislative and health and safety requirements
- I supervised and inspected the installation, commissioning, and modification of equipment while executing the CAPEX project
- I conducted safe operating procedures and risk assessments and supervised the Engineers
- I conducted weekly project progress updates and reporting.

C) Personal Engineering Activity

[CE 3.7]

Old water tanks were salvaged and used for water storage that is used for the sprinkler system. Old cladding sheets that are of good condition were used to cover the dog house

structure which reduced the overall cost of the project. Since Natsteel's main business involves reinforcement solutions, Materials like mesh, couplers, and piling cages were fabricated within the campus thus reducing the overall material cost for the project. The complete schedule was performed using MS projects and the data's input to CCPM (critical chain project management) software to identify the critical path of the project. Moreover, I worked on the concrete and steel structure handling which was taken care of by the civil contractor. I was responsible for overseeing the installation of dust netting and a doghouse for the slag pit. This project aimed to mitigate dust emissions and provide a designated space for operators in the slag pit area.To begin the installation process, I carefully reviewed the design plans and specifications provided by the project team. I ensured that all the necessary materials, equipment, and tools were available and ready for use.

[CE 3.8]

I worked closely with the team of technicians and contractors, and I supervised and coordinated the installation activities. I provided clear instructions and guidance on the proper positioning and anchoring of the dust netting to create an effective barrier against dust particles. I also supervised the construction of the doghouse, ensuring it was built to specifications and provided a safe and comfortable workspace for operators.Throughout the installation, I conducted regular inspections to verify the quality of workmanship and adherence to safety protocols. I addressed any issues or deviations from the plans promptly, ensuring that the installation was carried out correctly and in line with the project requirements.Additionally, I collaborated closely with the project team to ensure seamless integration of the dust netting and doghouse with the existing infrastructure. This involved coordinating with other stakeholders, such as the environmental and safety departments, to ensure compliance with regulations and standards.By overseeing the installation of the dust netting and doghouse, I contributed to the successful completion of the project. This installation provided an effective solution for reducing dust emissions in the slag pit area and created a dedicated space for operators, improving their safety and comfort.Throughout the execution of the CAPEX project, I took on the responsibility of supervising and inspecting the installation, commissioning, and modification of equipment. I closely monitored each phase to ensure that all activities were carried out with precision and adherence to project specifications.

[CE 3.9]

During the installation process, I supervised the technicians and contractors, providing guidance and oversight to ensure that the equipment was installed correctly and in accordance with the specified guidelines. I conducted regular inspections to verify the proper positioning, alignment, and connections of the equipment. If any modifications were required, I promptly identified them and ensured their accurate implementation.Additionally, I played a key role in conducting safe operating procedures and risk assessments. It was my duty to ensure that all necessary safety protocols were in place and followed diligently throughout the project. I collaborated closely with engineers, providing supervision and guidance to ensure that all safety measures were effectively implemented and monitored.To keep all stakeholders informed, I conducted weekly

project progress updates and reporting. I compiled comprehensive reports that outlined the status of the project, including milestones achieved, challenges faced, and any necessary adjustments to the project plan. These updates helped to maintain clear communication and alignment among the project team and stakeholders.By supervising and inspecting the installation, commissioning, and modification of equipment, conducting safe operating procedures and risk assessments, and providing regular project progress updates, I played a critical role in the successful execution of the CAPEX project. My close attention to detail, coordination with engineers, and effective communication helped ensure that the project progressed smoothly, met safety requirements, and achieved its objectives.

[CE 3.10]

Throughout the execution of the CAPEX project, I took on the responsibility of supervising and inspecting the installation, commissioning, and modification of equipment, ensuring that each step was executed meticulously.During the installation phase, I closely supervised the technicians and contractors involved. I provided detailed instructions and guidance to ensure that the equipment was installed accurately and in compliance with the specified guidelines. I conducted regular inspections to verify the proper positioning, alignment, and connections of the equipment. If any modifications or adjustments were required, I promptly identified them and coordinated with the relevant teams to ensure their correct implementation.As part of my role, I prioritized safety and conducted comprehensive safe operating procedures and risk assessments. I collaborated closely with engineers, safety personnel, and other stakeholders to identify potential risks and develop effective mitigation strategies. I ensured that all necessary safety protocols were in place and strictly followed throughout the project. Regular safety inspections were conducted, and I provided supervision and guidance to the engineers to ensure that safety measures were effectively implemented and monitored.In addition to my supervisory duties, I played an active role in maintaining effective communication and reporting.

[CE 3.11]

The Ladle furnace discharge slag pit presented environmental challenges that needed to be addressed. The main objective of the project was to significantly improve the environmental conditions in the slag pit area, mitigating potential risks and ensuring compliance with environmental regulations.To achieve this objective, a comprehensive plan was developed to tackle various aspects of environmental issues. One key area of focus was dust emissions. The project aimed to minimize dust particles generated during the ladle furnace discharge process, as excessive dust could have adverse effects on air quality and pose health and safety risks to personnel.To address this measures such as the installation of dust netting were implemented. The dust netting acted as a physical barrier, preventing the dispersion of dust particles into the surrounding atmosphere. This significantly reduced the environmental impact of dust emissions, creating a cleaner and safer working environment for personnel.Another aspect of the project was the installation of a doghouse within the slag pit area. The doghouse provided a designated workspace for operators, enhancing their safety and comfort. Having a dedicated area for operators, ensured that they could carry out their tasks efficiently and effectively, reducing the potential for accidents or injuries.In addition to the physical installations, the project also

included the implementation of safe operating procedures and risk assessments. This involved conducting a thorough evaluation of the work processes and identifying potential hazards and risks. By establishing and enforcing safe operating procedures, the project aimed to minimize risks to personnel and ensure compliance with safety regulations.

[CE 3.12]

I conducted weekly project progress updates and reporting to keep all stakeholders informed about the status of the project. These updates included details about milestones achieved, challenges encountered, and any necessary adjustments made to the project plan. I actively engaged with the project team and stakeholders, addressing any concerns or issues that arose and working collaboratively to find solutions.

D) Summary

[CE 3.13]

By meticulously supervising and inspecting the installation, commissioning, and modification of equipment, conducting thorough safe operating procedures and risk assessments, and providing regular and comprehensive project progress updates, I ensured that the CAPEX project was executed successfully. My attention to detail, effective coordination with engineers, and commitment to safety contributed to the overall success of the project.

[CE 3.14]

Overall, the project sought to create a significant positive impact on the environmental condition of the Ladle furnace discharge slag pit. By implementing measures such as dust netting, the installation of a doghouse, and the establishment of safe operating procedures, the project aimed to enhance the working environment, reduce dust emissions, and improve overall safety. These efforts not only ensured compliance with environmental regulations but also promoted the well-being and productivity of personnel working in the slag pit area.

[CE 3.15]

Furthermore, regular monitoring and inspections were conducted to assess the effectiveness of the implemented measures and identify areas for improvement. This allowed for ongoing evaluation and adjustment of the project's strategies to achieve the desired environmental improvements.

PROFESSIONAL ENGINEER
Summary Statement

These are the competency Units and Elements. These elements must be addressed in the Summary Statement (see Section C). If you are applying for assessment as a Professional Engineer, you will need to download this page, complete it and lodge it with your application.

Competency Element	A brief summary of how you have applied the element	Paragraph number in the career episode(s) where the element is addressed
PE1 KNOWLEDGE AND SKILL BASE		
PE1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline	The three Industrial Engineering projects which I did were: • Revamping of 80T DC Electric Arc Furnace with Shaft Technology. • Revamping EAF Slag Pit. • Installation of Dust Netting & Doghouse for Slag Pit.	CE 1.1, CE 2.1, CE 3.1
PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics and computer and information sciences which underpin the engineering discipline	I worked on improving the safety of the operators during inspection after every batch of steel produced by redesigning the furnace tapping position from RBT. I conducted the feasibility study for projects covering availability and reliability improvement. I reviewed the feasibility study for projects covering availability and reliability improvement.	CE 1.4 CE 2.6 CE 3.6

PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline	I worked on enhancing the heat recovery from the furnace, which helps in pre-heating the scrap inside the shaft. I supervised and inspected the installation, commissioning, and modification of equipment while executing the capex project. I supervised and inspected the installation, commissioning, and modification of equipment while executing the CAPEX project	CE 1.5 CE 2.7 CE 3.7
PE1.4 Discernment of knowledge development and research directions within the engineering discipline	I drove health and safety, commercial outcomes, procurement, engineering, and people management across maintenance projects. I conducted thorough inspections to verify the correct positioning, alignment, and connections of the equipment. I provided clear instructions and guidance on the proper positioning and anchoring of the dust netting to create an effective barrier against dust particles.	CE 1.6 CE 2.9 CE 3.8

PE1.5 Knowledge of contextual factors impacting the engineering discipline	I was assigned to conduct a feasibility study to assess the viability and potential benefits of implementing availability and reliability improvement measures. I conducted thorough research and analysis to develop a comprehensive project plan, considering factors such as feasibility, resource allocation, and potential risks. I conducted regular inspections to verify the proper positioning, alignment, and connections of the equipment.	CE 1.9 CE 2.10 CE 3.9
PE1.6 Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline	I assessed the compatibility and integration of the new equipment with the existing infrastructure. I maintained open lines of communication with the installation team, providing guidance and clarification when needed. I conducted regular inspections to verify the proper positioning, alignment, and connections of the equipment.	CE 1.10 CE 2.11 CE 3.10
PE2 ENGINEERING APPLICATION ABILITY		
PE2.1 Application of established engineering methods to complex engineering problem solving	Applied the critical industrial engineering practices in the project which overall led to accomplish the needed project objectives.	CE 1.9, CE 2.9, CE 3.8
PE2.2 Fluent application of engineering techniques, tools and resources	Industrial Engineering work principles being critically followed in acquiring the mandatory work outputs.	CE 1.10, CE 2.10, CE 3.11
PE2.3 Application of systematic engineering synthesis and design processes	Conducted the set systematic work research which overall helped achieving the required work outcomes.	CE 1.11, CE 2.14. CE 3.12
PE2.4 Application of systematic approaches to the conduct and management of engineering projects	Followed the core work parameters which overall strengthened technical knowledge and helped achieving the needed project objectives.	CE 1.12, CE 2.12, CE 3.13
PE3 PROFESSIONAL AND PERSONAL ATTRIBUTES		

PE3.1 Ethical conduct and professional accountability	Followed the ethical work activities in the project which helped achieving the set work results.	CE 1.8, CE 2.8, CE 3.9
PE3.2 Effective oral and written communication in professional and lay domains	Implemented the definite communication practices in the project to achieve the core work outcomes.	CE 1.11, CE 2.11, CE 3.11
PE3.3 Creative innovative and proactive demeanour	Applied the set creative work practices which led to achieve the needed work outputs.	CE 1.10, CE 2.10, CE 3.10
PE3.4 Professional use and management of information	Made usage of the definite work principles which helped achieving the core work results within the set work objectives.	CE 1.13, CE 2.13, CE 3.11
PE3.5 Orderly management of self, and professional conduct	Applied the orderly conduct with the self-management activities consistently followed to achieve the definite work outputs.	CE 1.12, CE 2.14, CE 3.12
PE3.6 Effective team membership and team leadership	Implemented the team membership concepts in an effective manner to acquire the required work results.	CE 1.14, CE 2.12, CE 3.14