

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR AUTOMOTIVE INDUSTRY

What are Occupational Standards (OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualification Pack- Prototyping Engineer

SECTOR: AUTOMOTIVE

SUB-SECTOR: RESEARCH & DEVELOPMENT

OCCUPATION: PROTOTYPING

JOB ROLE: PROTOTYPING ENGINEER

REFERENCE ID: ASC/Q8301

ALIGNED TO : NCO-2004/ Nil

Prototype engineer: Individuals at this job need to support managers to coordinate with different departments and functions for manufacturing of prototype vehicle/parts that will finally be used for testing and validation.

Brief Job: The role entails ensuring that assembly line fitters are assembling the prototype electrical and mechanical components as per the New Product requirement and the machine shop/ casting shop/ forging shop are preparing various aggregates through different machining operations

Personal Attributes: The individual should be willing to work at shop floor for long hours. The individual should possess coordination and interpersonal skills. The individual should also be able to demonstrate skills for information ordering, imagination, analytical reasoning, technology, customer orientation, oral expression and comprehension

Job Details	Qualifications Pack Code	ASC/Q8301		
	Job Role	Prototyping Engineer		
	Credits(NSQF)	TBD	Version number	1
	Industry	Automotive	Drafted on	15/12/2013
	Sub-sector	R&D	Last reviewed on	30/12/2013
	Occupation	Prototyping	Next review date	30/12/2015

Job Role	Prototyping Engineer
Role Description	Responsible for prototyping operation and assembly of vehicle as per the New Product Development process requirements
NSQF level	6
Minimum Educational Qualifications	B.E/ B Tech in Mechanical/ Automobile engineering
Maximum Educational Qualifications	M.E/ M.Tech in Mechanical/ Automobile engineering
Training (Suggested but not mandatory)	<ul style="list-style-type: none"> Basic prototyping techniques Automotive sector regulations Usage of different types of assembly tools 5S and Safety Problem solving Quality Management Team management skills
Experience	2-3 years in Research and Development(for B.E)
Occupational Standards (OS)	<ol style="list-style-type: none"> ASC/8301:Understand processes and equipment requirement to complete the task ASC/N8302: Preparing the machine, auxiliary apparatus and metal work pieces ASC/N8303: Performing the actual prototyping operations ASC/N0006C: Maintain a safe and healthy working environment at the workplace ASC/N0022: Ensure implementation of 5S activities at the shop floor and the office area

Definitions

Keywords /Terms	Description
Core Skills/Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Organisational Context	Organisational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
Qualifications Pack(QP)	Qualifications Pack comprises the set of NOS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Scope	Scope is the set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on the quality of performance required.
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.

Sub-Sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Sub-functions	Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Unit Code	Unit Code is a unique identifier for a NOS unit, which can be denoted with an 'N'
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.
Keywords /Terms	Description
NOS	National Occupational Standard(s)
NVEQF	National Vocational Education Qualifications Framework
NVQF	National Vocational Qualifications Framework
NSQF	National Skills Qualifications Framework
OEM	Original Equipment Manufacturer
OS	Occupational Standard(s)
QP	Qualifications Pack
CAD/CAE	Computer Added Design/ Engineering
APQP	Advance Product Quality Planning
DFMEA/ PFMEA	Design/ Process Failure Modes and Effects Analysis
SOP	Standard Operating Procedure

Acronyms

National Occupational Standards

Overview

This unit is about understanding the job requirement and hence understand the activities & equipment associated with the process to complete the task

ASC/N8301: Understand the process and equipment requirement to complete the task

National Occupational Standard	Unit Code	ASC/N8301
	Unit Title (Task)	Understanding process and equipment requirement to complete the task
	Description	This OS unit is about understanding the job requirement, what processes need to be executed, what equipment's will be used for the activity and what is the required output considering the standards specified
	Scope	<p>The person will be responsible for</p> <ul style="list-style-type: none"> Understand the machining & assembling requirements, equipment and parameters to be set for the process Escalations of queries on the given job <p>The role has Internal Interfaces with Tool Room, Production, Quality, Material Management and stores</p>
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Understand the machining & assembling requirements, equipment and parameters to be set for the process	<p>PC1. Ensure that the team members understand and follow all the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors/ master technicians</p> <p>PC2. Ensure that all the drawings, sketches and models are understood at the beginning of the process to finalize the operations to be performed by the operator</p> <p>PC3. Ensure accurate understanding of the Geometric Dimensions and Tolerance before initiating the product making process</p> <p>PC4. Understand the right machining & assembling methodology and process to be adopted for completing the work order through discussions with the supervisor/ master technician and reading the process manuals/ Work Instructions/Standard Operating Procedures</p> <p>PC5. Understand the various machining processes (manual as well as on CNC) like grinding, tapering, milling, boring, cutting etc. which will be required during the tool making and die making process</p> <p>PC6. Understand the material required and the equipment availability for executing the activity</p> <p>PC7. Understand the various assembling process parameters like cycle time, fitting tolerances, torque application, bolting and fastening before starting the assembling process, as mentioned in the Work Instructions/ SOP manual</p> <p>PC8. Understand 5 S related to the work station and line area</p>
	Escalations of queries on the given job	<p>PC9. In case while understanding the drawings and sketches some problems are observed, ensure that they are highlighted to the design team</p> <p>PC10. Refer the queries to a competent internal specialist if they cannot be resolved by the operator on own</p> <p>PC11. Obtain help or advice from specialist if the problem is outside his/her area of competence or experience</p> <p>PC12. Confirm self-understanding with the specialist holding discussions so that all doubts & queries can be resolved before the actual process execution</p>
	Knowledge and Understanding (K) w.r.t. the scope	

ASC/N8301: Understand the process and equipment requirement to complete the task

Element	Knowledge and Understanding
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant standards and procedures followed in the company KA2. different types of products manufactured by the company KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. good understanding of prototyping and testing process KB2. understanding on homologation and validation process KB3. knowledge in tools like CAD, CAM, CAE, PRO-E etc. KB4. information systems like SAP, ERP etc. KB5. knowledge of simulation software, DFMEA, APQP basic preparation process of machine and machine settings KB6. operations for various machining related tools KB7. the method of reading and interpreting the various drawings (2D, 3D and line sketches) KB8. how to visualize the final product output and conduct quality verification tests
Skills (S) [Optional]	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA1. document the available information SA2. note down observations (if any) in the given format SA3. write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA4. read and interpret technical specifications of the specimen SA5. read equipment manuals and process documents to understand the equipment's and processes better SA6. read internal information documents sent by internal teams SA7. read and interpret technical customer drawings SA8. read engineering drawings and symbols used in drawings and sketches
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA9. discuss task lists, schedules and activities with the supervisor SA10. effectively communicate with the team members SA11. question the shop supervisor in order to understand the nature of the problem and to clarify queries SA12. attentively listen with full attention and comprehend the information given by the speaker

ASC/N8301: Understand the process and equipment requirement to complete the task

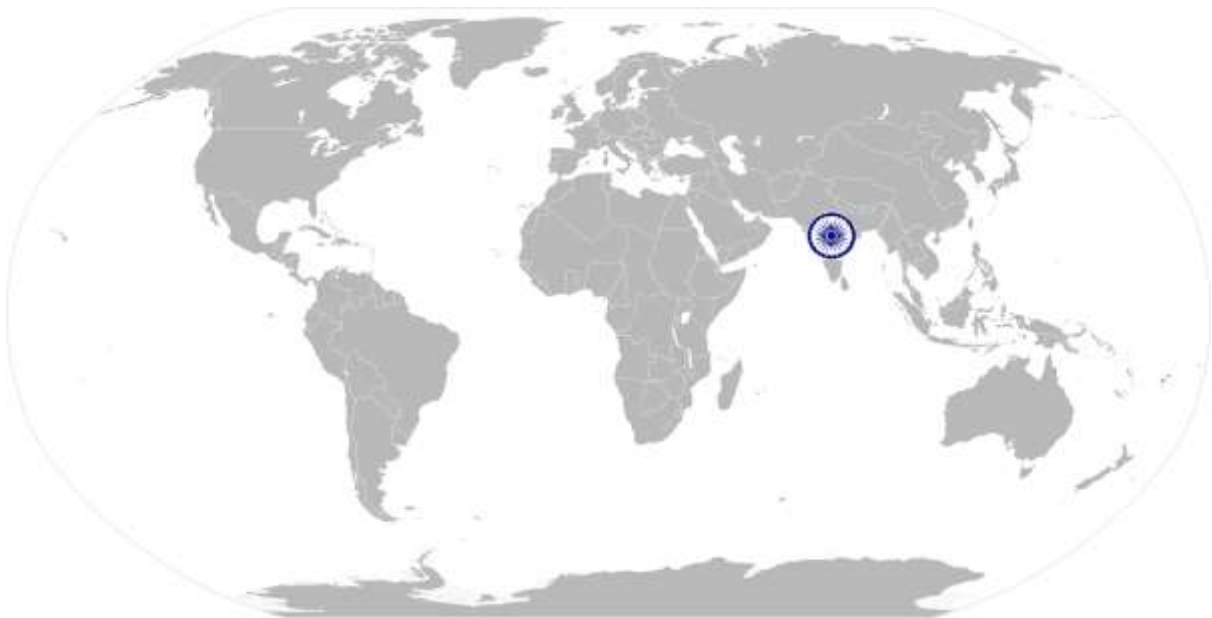
B. Professional Skills	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB1. plan and organize the work order and jobs received from the Operator SB2. organize all process/ equipment manuals so that sorting/ accessing information is easy SB3. support the supervisor in scheduling tasks for tool room helper
	Judgment and Critical Thinking
	The user/individual on the job needs to know and understand how to: SB4. use common sense and make judgments during day to day basis SB5. use reasoning skills to identify and resolve basic problems use intuition and keen observation skills to detect any potential problems which could arise during operations
	Desire to learn and take initiatives
	The user/individual on the job needs to know and understand how to: SB6. follow instructions and work on areas of improvement identified SB7. complete the assigned tasks with minimum supervision SB8. complete the job defined by the supervisor within timelines and quality norms
	Problem Solving and Decision making
	The user/individual on the job needs to know and understand how to: SB9. detect problems in day to day tasks SB10. support supervisor in using specific problem solving techniques and detailing out the problems SB11. discuss possible solution with the supervisor for problem solving SB12. make decisions in emergency conditions in case the supervisor is not available(as per the authority matrix defined by the organization)

NOS Version Control

NOS Code	ASC/N8301		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	15/12/2013
Industry Sub-sector	R & D	Last reviewed on	30/12/2013
Occupation	Prototyping	Next review date	30/12/2015

ASC/N8302: Preparing the machine, auxiliary apparatus and metal work pieces

National Occupational Standards



Overview

This unit is about preparing the machine, auxiliary apparatus and the metal work pieces.

ASC/N8302: Preparing the machine, auxiliary apparatus and metal work pieces

Unit Code	ASC/N8302
Unit Title (Task)	Preparing the machine, auxiliary apparatus and metal work pieces
Description	This NOS is about preparing the surface of the metal parts by removing dust, moistures etc., cleaning the manufacturing and assembling apparatus and installing the metal parts on the manufacturing and assembling machine
Scope	<p>The person needs to</p> <ul style="list-style-type: none"> • Ensure arrangement for working ,manual or computer controlled, equipment's for machining , PPE's and other material as per the requirement of the machining process • Ensure cleaning the machining/assembling equipment before executing the operations and setup the equipment • Escalations of queries for the given job <p>The role has internal interfaces with Tool Room, Production, Quality, Materials</p>
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Ensure arrangement for working ,manual or computer controlled, equipment's for machining , PPE's and other material as per the requirement of the machining process	<p>PC1. Understand the material required and the equipment availability for executing the activity</p> <p>PC2. Ensure that the related engineering drawings and sketches are available before starting the product manufacturing process</p> <p>PC3. Ensure that the required material is procured from the store before starting the machining / other necessary process</p> <p>PC4. Ensure that the helper/ assistant technician brings the required material and tools before the start of the assembling operations</p>
Ensure cleaning the machining/assembling equipment before executing the operations and setup the equipment	<p>PC5. Ensure that the helper/ assistant operator cleans the surface of the machines to remove dust and any other impurities like grease, oil, paint etc.</p> <p>PC6. Ensure that the assembly apparatus is setup as per the selected assembling process and the internal SOPs/ Work Instructions and the setting standards for the machine</p> <p>PC7. Ensure that the calibration of the manufacturing tools and measuring tools is accurate</p>
Escalations of queries for the given job	<p>PC8. Immediately refer the queries to the supervisor to avoid any delay in the actual process</p> <p>PC9. Confirm self-understanding to the shop head during the discussions so that all doubts & queries can be resolved before the actual process execution</p>
Knowledge and Understanding (K) w.r.t. the scope	
Element	Knowledge and Understanding
A. Organizational Context (Knowledge of the company / organization and its	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant standards and procedures followed in the company</p> <p>KA2. different types of products manufactured by the company</p> <p>KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for</p>

ASC/N8302: Preparing the machine, auxiliary apparatus and metal work pieces

processes)	query resolution
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. good understanding of prototyping and testing process</p> <p>KB2. understanding on homologation and validation process</p> <p>KB3. knowledge in tools like CAD, CAM, CAE, PRO-E etc.</p> <p>KB4. information systems like SAP, ERP etc.</p> <p>KB5. knowledge of simulation software, DFMEA, APQP basic preparation process of machine and machine settings</p> <p>KB6. operations for various machining related tools</p> <p>KB7. the method of reading and interpreting the various drawings (2D, 3D and line sketches)</p> <p>KB8. how to visualize the final product output and conduct quality verification tests</p>
Skills (S) w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information</p> <p>SA2. note down observations (if any) related to the process</p> <p>SA3. write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. read and interpret technical specifications of the assemble specimen</p> <p>SA5. read equipment manuals and process documents to understand the equipment's and processes better</p> <p>SA6. read internal information documents sent by internal teams</p> <p>SA7. read and interpret engineering drawings</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA8. discuss task lists, schedules and activities with the supervisor</p> <p>SA9. effectively communicate with the team members</p> <p>SA10. question the supervisor in order to understand the nature of the problem and to clarify queries</p> <p>SA11. attentively listen with full attention and comprehend the information given by the speaker</p>
B. Professional Skills	Plan and Organize
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. plan and organize the work order and jobs received from the Operator</p> <p>SB2. organize all process/ equipment manuals so that sorting/ accessing information is easy</p>
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. visualize the final job product after understanding the given drawing/</p>

ASC/N8302: Preparing the machine, auxiliary apparatus and metal work pieces

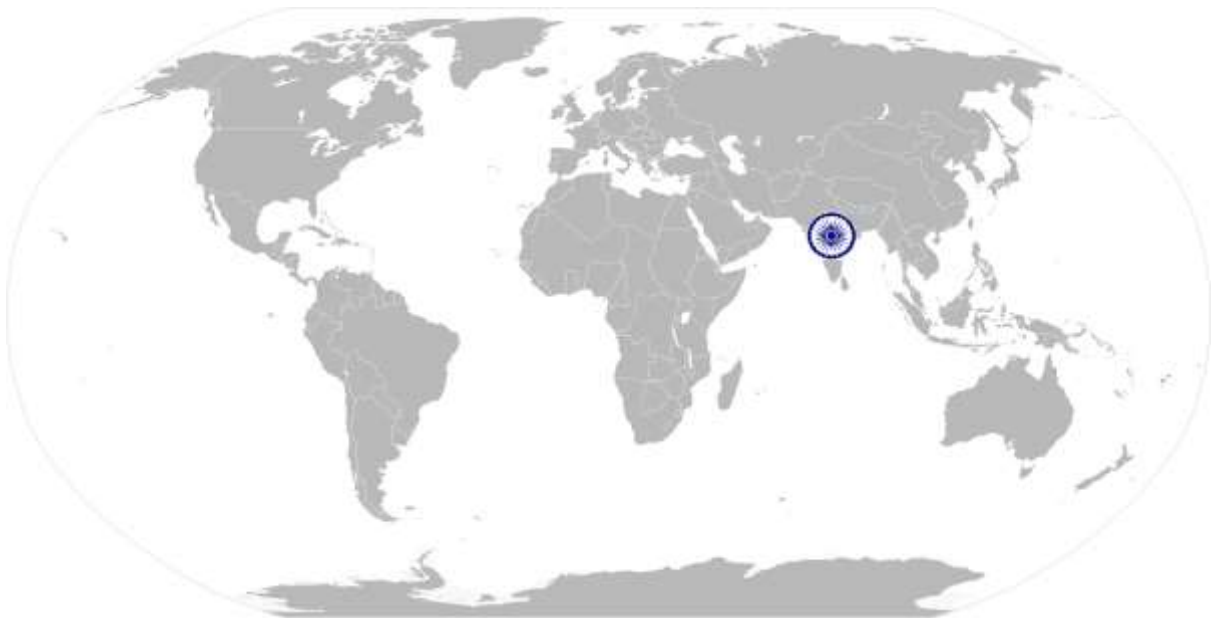
	sketches
	SB4. co relate the type of job output required with the machining/assembling methodology to be used
	SB5. identify the strengths and weakness of various assembling process
	Judgment and Critical Thinking
	The user/individual on the job needs to know and understand how to: SB6. use common sense and make judgments during day to day basis SB7. use reasoning skills to identify and resolve basic problems
	Desire to learn and take initiatives
	The user/individual on the job needs to know and understand how to:
	SB8. follow instructions and work on areas of improvement identified and complete the assigned tasks with minimum supervision
	SB9. complete the job defined by the supervisor within the timelines and quality norms
	SB10. take self-initiatives in driving small projects with the supervisor like operation improvement, training of helpers and assistant operators, 5S, Kaizen etc

NOS Version Control

NOS Code	ASC/N8302		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	15/12/2013
Industry Sub-sector	R & D	Last reviewed on	30/12/2013
Occupation	Prototyping	Next review date	30/12/2015

ASC/N8303: Performing the actual prototyping operations

National Occupational Standard



Overview

This unit is about Product Proto Development form the 2D drawing and the vehicle model given by the design team

ASC/N8303: Performing the actual prototyping operations

Unit Code	ASC /N8303
Unit Title (Task)	Performing the actual prototyping operations
Description	This NOS is about performing the actual prototyping operations form the 2D drawing and vehicle model given by the design team
Scope	<p>The person is responsible for</p> <ul style="list-style-type: none"> developing Phase 1 prototype developing Phase 2 Prototype developing Phase 3 Prototype developing Documentation and record keeping <p>The role has internal interfaces with Tool Room, Assembly line, machine shop, Casting shop, forging shop, Quality Control and Material Management</p>
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
Phase 1prototype	<p>PC1. Ensure that the operator receives the 2D drawing from the design team after clearance from the Quality</p> <p>PC2. Study the drawings/ sketches to understand the operations to be performed by the operator/ machinist and plan sequences of operations for fabricating products</p> <p>PC3. Ensure proper selection of material from the vendors to be used based on properties like hardness and tolerance for forming the product</p> <p>PC4. Make the product from the representative aggregates made from temporary loading or conveyor parts</p> <p>PC5. Ensure usage of borrowed parts from the similar vehicles to avoid duplication</p> <p>PC6. Ensure usage of the scrap/redundant parts of the existing vehicle</p> <p>PC7. Ensure that the work pieces are sized, machined and assembled at the respective manufacturing areas as per the drawings</p> <p>PC8. Ensure that the basic safety compliances are met in the prototype</p> <p>PC9. Ensure that the body and chassis system specifications are met</p> <p>PC10. Ensure for proper front , side and roof crash protection</p> <p>PC11. Ensure for packaging and dynamic clearances</p> <p>PC12. Ensure proper outline ergonomics checks</p> <p>PC13. Ensure that the complete concept of new product /new technology is evaluated and a proper feedback is given to the deign team</p> <p>PC14. Verify the conformance of the output product to the specifications mentioned in the Work Instructions/ SOPs using precision measurement tools</p> <p>PC15. Ensure that routine maintenance activities are carried out by the operator as per the checklist provided by the maintenance team</p>
Phase 2 Prototype	<p>PC16. Ensure that the process starts after the 2ndDrawing release vehicle from the design team and verified by the Quality team</p> <p>PC17. Ensure that the operator receives the changed 2D drawing from the design team and designs the product as per the design layouts</p> <p>PC18. Study the drawings/ sketches to understand the operations to be performed by the operator/ machinist and plan sequences of operations for fabricating</p>

ASC/N8303: Performing the actual prototyping operations

	<p>products</p> <p>PC19. Ensure that the parts are made from soft tools & through alternate methods and processes</p> <p>PC20. Ensure that the intended product design achieves the functional & performance requirements on fuel type, vehicle ground clearances, High voltage testing and fitment of all major components</p> <p>PC21. Ensure that the vehicle architectural systems are validated</p> <p>PC22. Ensure enablement of the evaluation , improvement and finalization of the design after this stage</p> <p>PC23. Ensure initiation of DFMEA , DFA, DFM is initiated and completed during the Alpha prototype phase</p> <p>PC24. Verify the conformance of the output product to the specifications mentioned in the Work Instructions/ SOPs using precision measurement tools</p> <p>PC25. Ensure that routine maintenance activities are carried out by the operator as per the checklist provided by the maintenance team</p>
Phase 3 Prototype	<p>PC26. Ensure that the process starts after the 3rd Drawing release vehicle from the design team and verified by the Quality team</p> <p>PC27. Ensure that the operator receives the changed 2D drawing from the design team and designs the product as per the design layouts</p> <p>PC28. Study the drawings/ sketches to understand the operations to be performed by the operator/ machinist and plan sequences of operations for fabricating products</p> <p>PC29. Ensure that the condition of permanent tooling / final profile as directed by this release is adhered to.</p> <p>PC30. Ensure achievement of desired functional & performance specifications and technical targets on High Voltage system, Brake handling and on- road testing</p> <p>PC31. Ensure achievement of vehicle durability and reliability</p> <p>PC32. Ensure crashworthiness of the product</p> <p>PC33. Ensure compliance to Emission norms</p> <p>PC34. Ensure adherence to PFMEA process for vehicle manufacturing</p> <p>PC35. Provide feedback to the design team and ensure availability of all parts & reports from production tooling to handover the prototype to the process control and production team</p> <p>PC36. Handover the product to test centre for various durability and performance testing</p>
Documentation and record keeping	<p>PC37. Ensure all records related to prototyping are maintained in the format used by the organization/ process mentioned in the Work Instructions</p> <p>PC38. Report any issues observed during record keeping to the supervisor in a timely Manner</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant standards and procedures followed in the company</p> <p>KA2. different types of products manufactured by the company</p> <p>KA3. quality management practices of the organization</p>

ASC/N8303: Performing the actual prototyping operations

B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. good understanding of prototyping and testing process</p> <p>KB2. understanding on homologation and validation process</p> <p>KB3. knowledge in tools like CAD, CAM, CAE, PRO-E etc.</p> <p>KB4. information systems like SAP, ERP etc.</p> <p>KB5. knowledge of simulation software, DFMEA, APQP basic preparation process of machine and machine settings</p> <p>KB6. operations for various machining related tools</p> <p>KB7. the method of reading and interpreting the various drawings (2D, 3D and line sketches)</p> <p>KB8. how to visualize the final product output and conduct quality verification tests</p>
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. document information</p> <p>SA2. note down observations (if any) related to the design aspect</p> <p>SA3. write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. read and interpret technical 2D drawings</p> <p>SA5. read and understand the various tolerances and specifications for the product</p> <p>SA6. read internal information documents sent by internal teams</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA7. discuss task lists, schedules and activities with the supervisor</p> <p>SA8. effectively communicate with the team members</p> <p>SA9. question the customer in order to understand the nature of the problem and to clarify queries</p> <p>SA10. attentively listen with full attention and comprehend the information given by the speaker</p>
B. Professional Skills	Plan and Organize
	<p>The user/individual on the job needs to know and understand:</p> <p>SB1. plan and organize the work order and jobs received</p> <p>SB2. plan and organize the design/ process/quality documents received from internal customers</p> <p>SB3. organize all manuals so that sorting out information is fast</p>
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB4. carefully analyse the 2D drawing for various customer specifications</p> <p>SB5. carefully do the manufacturing and assembly operations with relevant actions as listed in SOP/WI</p>
	Problem Solving and Decision making

ASC/N8303: Performing the actual prototyping operations

	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB6. detect problems in day to day tasks SB7. support supervisor in using specific problem solving techniques and detailing out the problems SB8. discuss possible solution with the supervisor for problem solving SB9. make decisions in emergency conditions in case the supervisor is not available(as per the authority matrix defined by the organization)
	Quality Consciousness
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB10. identify defective parts in the manufacturing line by comparing manufactured pieces with the work standard SB11. link the defect observed with the overall impact on the performance of the component
	Initiative Taking
	<ul style="list-style-type: none"> SB12. clearly establishes a goal for self or others to accomplish SB13. empowers subordinates to achieve desired results SB14. be a role model for the team and lead from front SB15. motivates and engages team members, rewards and encourages team to achieve SB16. resolves team conflicts
	Team Work and Collaboration
	<ul style="list-style-type: none"> SB17. contributes to building a positive team spirit SB18. contributes individual strengths & maximize team performance SB19. exhibits objectivity & openness to others' views SB20. collaborates with stakeholders to achieve the desired state of result
	Decision making
	<p>The user/individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB21. use previous experience in resolving problems and taking decisions SB22. make timely and independent decisions on the line/ shift within the boundaries of the delegation matrix of the organization
	Out of Box thinking
	<p>The user/ individual on the job needs to know and understand how to:</p> <ul style="list-style-type: none"> SB23. familiarise with leading practices available in the market SB24. think independently on new approaches to manufacturing process, material management, data management and team management SB25. represent any new ideas/ approaches on process improvement and productivity improvement to the seniors in the team
	Customer Orientation
	<ul style="list-style-type: none"> SB26. understands customer needs SB27. addresses customer needs SB28. manages customer relationships SB29. understands importance of customer feedback and drives customer focus

ASC/N8303: Performing the actual prototyping operations

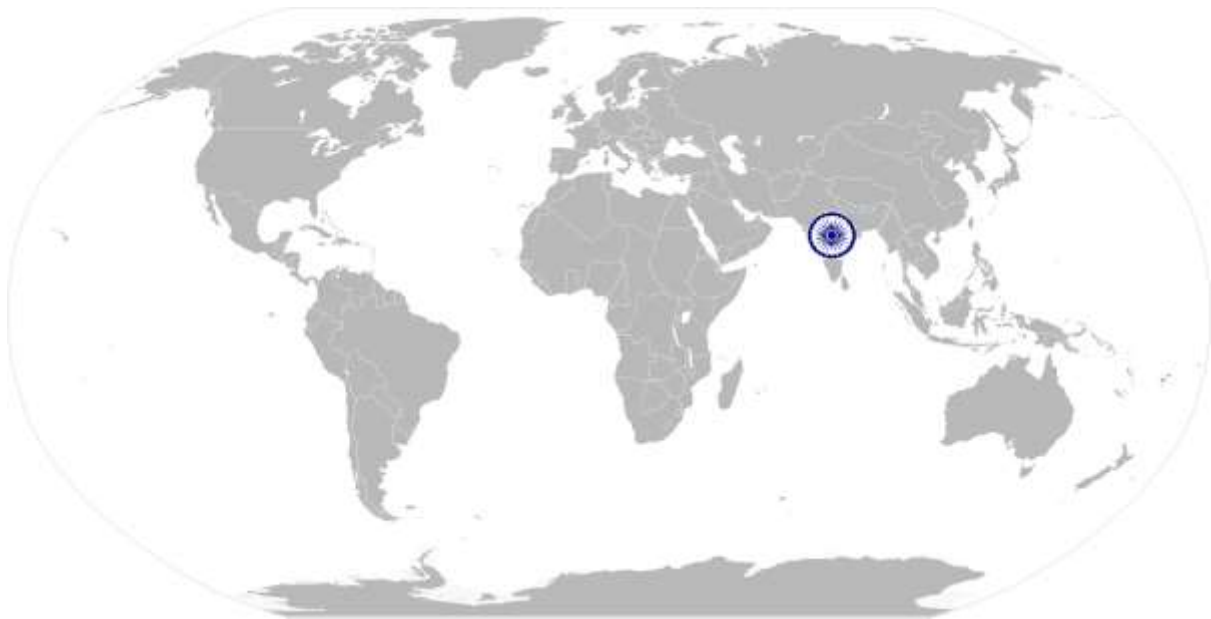
NOS Version Control

NOS Code	ASC/N8303		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	15/12/2013
Industry Sub-sector	R & D	Last reviewed on	30/12/2013
Occupation	Prototyping	Next review date	30/12/2015



ASC/N0006C: Maintain a healthy and safe working environment at the workplace

National Occupational Standard



Overview

This unit is about establishing a Safe, Healthy and Environment friendly workplace

ASC/N0006C: Maintain a healthy and safe working environment at the workplace

National Occupational Standard	Unit Code	ASC/N0006C
	Unit Title (Task)	Maintain a safe and healthy working environment at the work place
	Description	This NOS unit is about creating a Safe and Healthy work place, adhering to the safety guidelines in the working area, following practices which are not impacting the environment in a negative manner and training team members on health and safety related issues
	Scope	<p>The role holder will be responsible for:</p> <ul style="list-style-type: none"> identifying and reporting risks creating and sustaining a safe, clean and environmental friendly work place <p>This NOS will be applicable to all Automotive sector manufacturing job roles</p>
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Display awareness to the potential safety risks	<p>PC1. Display understanding of the activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise</p> <p>PC2. Be aware of the areas in the plant/ lab facility which are potentially hazardous/ unhygienic in nature</p> <p>PC3. Understand all risk involving and hazardous areas near the work place are marked/ tagged in order to caution the users of the work area/ machinery</p> <p>PC4. Attend awareness drives held amongst other on sharing information on the identified risks.</p> <p>PC5. Attend periodic awareness sessions are conducted</p>
	Display awareness towards maintaining a Safe, clean and environment friendly work place	<p>PC6. Wear the recommended Personal Protective Equipment (PPE) and also ensure self-usage of the required PPEs when entering the plant premises</p> <p>PC7. Display awareness of the instructions given on the equipment manual describing the operating process of the equipment to prevent any hazard</p> <p>PC8. Be aware of the first aid safety kit at the work place/ shop floor location and the requisite items to respond to minor injuries.</p> <p>PC9. Attend all safety and fire drills to be self-aware of safety hazards and preventive techniques and ensure that the team participate in all the required safety and fire drills</p> <p>PC10. Participate in all safety related initiatives like Safety Committee participations, Safety Day Celebrations etc.</p> <p>PC11. Maintain high standards of personal hygiene at the work place</p> <p>PC12. Inform the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive</p>

ASC/N0006C: Maintain a healthy and safe working environment at the workplace

	actions can be planned for others
Knowledge and Understanding (K)w.r.t. the scope	
Element	Knowledge and Understanding
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant standards, procedures and policies related to Health, Safety and Environment followed in the company KA2. emergency handling procedures & hierarchy for escalation
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. basic knowledge of Safety procedures(fire fighting, first aid) within the organization KB2. knowledge of various types of PPEs and their usage KB3. basic knowledge of risks/hazards associated with each occupation in the organization KB4. how to safely operate various tools and machines and risks associated with the tools/ equipment KB5. knowledge of personal hygiene and how an individual can contribute towards creating a highly safe and clean working environment
Skills (S)w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA1. write basic level notes and observations SA2. note down observations (if any) related to the process SA3. write information documents to internal departments/ internal teams
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA4. read safety instructions put up across the plant premises SA5. read safety precautions mentioned in equipment manuals and panels to understand the potential risks associated
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA6. effectively communicate information to team members SA7. Inform employees in the plant and concerned functions about SA8. events, incidents & potential risks observed related to Safety, Health and Environment. SA9. question the process head/ safety team in order to understand the safety related issues SA10. attentively listen with full attention and comprehend the SA11. information given by the speaker during safety drills and training programs

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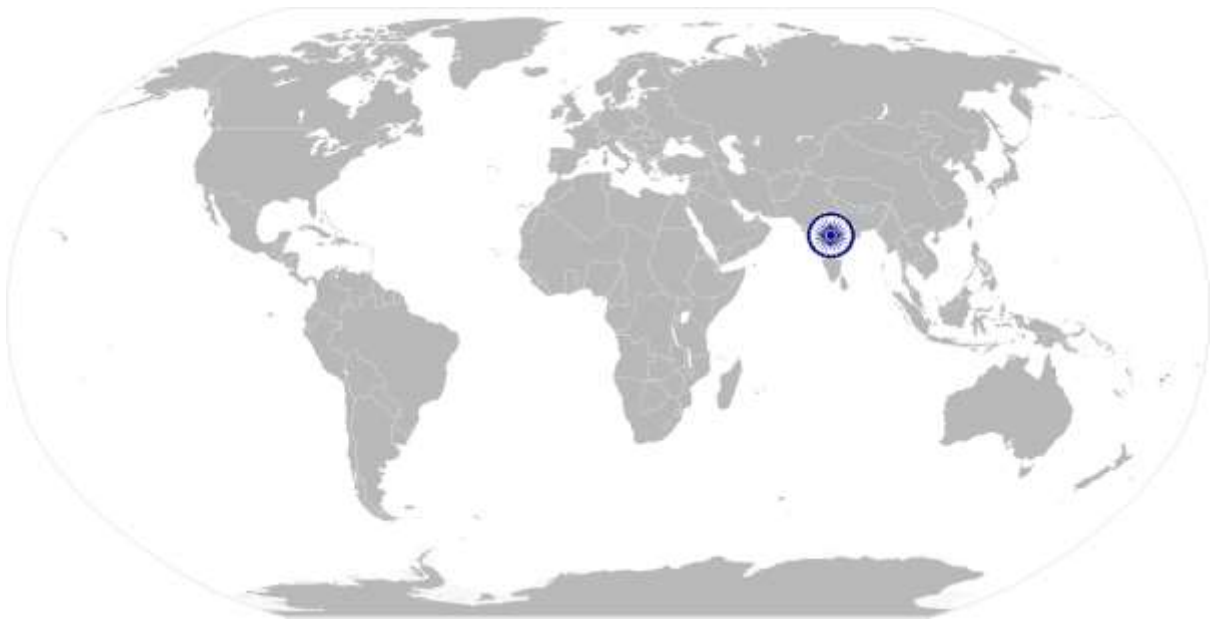
B. Professional Skills	Judgmental Thinking
	The user/individual on the job needs to know and understand how to: SB1. use common sense and make judgments during day to day basis SB2. use reasoning skills to identify and resolve basic problems
	Persuasion skills
	The user/ individual on the jobs needs to know and understand how to: SB3. persuade team members to wear Personal Protective Equipment as per requirement SB4. ensure that the team understands the importance of using various machines and equipment without creating any risk to human/ machine SB5. train team members on various risks identified
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB6. break the problem into smaller issues and tasks to arrive at a solution SB7. understand inter process relationship and establish relationship between various parts of the problem SB8. leverage experience to find effective solutions to problems SB9. use basic analytical tools to arrive at solutions

NOS Version Control

NOS Code	ASC/N0006C		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	15/12/2013
Industry Sub-sector	Research & Development	Last reviewed on	30/12/2013
Occupation	All	Next review date	30/12/2015

ASC/N0022: Ensure implementation of 5S activities at the shop floor and the office area

National Occupational Standard



Overview

This unit is about the implementing the various principles of 5S and ensure that the given guidelines are followed to ensure a clean and efficient working environment in the organization

ASC/N0022: Ensure implementation of 5S activities at the shop floor and the office area

National Occupational Standard

Unit Code	ASC/N0022
Unit Title (Task)	Ensure implementation of 5S activities at the shop floor & the office area
Description	This NOS is about overseeing the implementation of all 5 S activities both at the shop floor and the office area by the team members and training the team in implementation of the 5S principles
Scope	<p>The individual needs to</p> <ul style="list-style-type: none"> Ensure sorting, streamlining/ organizing, storage and documentation, systematic cleaning, standardization and sustenance across the plant and office premises of the organization as given in the organization guidelines
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Ensure proper sorting of items at the work place	<p>PC1. Ensure all recyclable materials are put in designated containers</p> <p>PC2. Ensure no Tools, fixtures & jigs are lying on workstations unless in use and no un-necessary items is lying on workbenches or work surfaces unless in use</p> <p>PC3. Ensure that the operators and other team members are segregating the waste in hazardous/ Non Hazardous waste as per the sorting work instructions</p> <p>PC4. Ensure that all the operators are following the technique of waste disposal and waste storage in the designated bins</p> <p>PC5. Segregate the items which are labelled at red tag items for the process area and keep them in the correct places</p> <p>PC6. Ensure that all the tools/ equipment/ fasteners/ spare parts are arranged as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions</p> <p>PC7. Check for return of any type of extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area</p> <p>PC8. Oversee removal of unnecessary equipment, storage, furniture, unneeded inventory, supplies, parts and material</p> <p>PC9. Ensure that areas of material storage areas are not overflowing</p> <p>PC10. Ensure proper stacking and storage of the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required</p>
Ensure proper documentation and storage – streamlining & organizing the workplace	<p>PC11. Ensure that the team follows the given instructions and checks for labelling of fluids, oils, lubricants, solvents, chemicals etc. and proper storage of the same to avoid spillage, leakage, fire etc.</p> <p>PC12. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions</p> <p>PC13. Ensure that organizing the workplace takes place with due considerations to the principles of wasted motions, ergonomics,</p>

ASC/N0022: Ensure implementation of 5S activities at the shop floor and the office area

	work & method study .
Ensure cleaning of self and the work place	<p>PC14. Ensure that the area has floors swept, machinery clean and is generally neat and tidy. In case of cleaning, ensure that correct displays are maintained on the floor which indicate potential safety hazards</p> <p>PC15. Ensure workbenches and work surfaces are clean and in good condition</p> <p>PC16. Ensure adherence to the cleaning schedule for the lighting system to ensure proper illumination</p> <p>PC17. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene</p>
Ensure standardization	<p>PC18. Ensure that daily cleaning standards and schedules to create a clean working environment are followed across the plant</p> <p>PC19. Oversee that various cleaning and organizing tasks have been developed and assigned for the work area</p> <p>PC20. Ensure logical and user friendly documentation and file management for all activities across the plant and create guidelines around standardization of processes</p> <p>PC21. Ensure timely creation and sharing of the 5S checklists</p> <p>PC22. Ensure that the 5S manual are available as per the timelines</p>
Ensure sustenance	<p>PC23. Ensure team cooperation during the audit of 5 S activities</p> <p>PC24. Ensure that workmen are periodically trained to address challenges related to 5S</p> <p>PC25. Participate actively in employee work groups on 5S and encourage team members for active participation</p> <p>PC26. Oversee that the staff/operators are trained and fully understand 5s procedures</p> <p>PC27. Ensure that all the guidelines for What to do and What not to do to build sustainability in 5S are mentioned in the 5S check lists/ work instructions and are easily searchable</p> <p>PC28. Ensure continuous training of the team members on 5S in order to increase their awareness and support implementation</p> <p>PC29. Ensure that all visual controls, notice boards, symbols etc. at the manufacturing place are created, working and are put up as per the requirement</p>
Knowledge and Understanding (K) w.r.t. the scope	
Element	Knowledge and Understanding
C. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA3. relevant standards, procedures and policies related to 5S followed in the company</p>

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D. Technical Knowledge	<p>The user/individual on the job needs to :</p> <p>KB6. have basic knowledge of 5S procedures</p> <p>KB7. know various types 5s practices followed in various areas</p> <p>KB8. understand the 5S checklists provided in the department/ team</p> <p>KB9. have skills to identify useful & non useful items</p> <p>KB10. have knowledge of labels , signs & colours used as indicators</p> <p>KB11. Have knowledge on how to sort and store various types of tools, equipment, material etc.</p> <p>KB12. know , how to identify various types of waste products</p> <p>KB13. understand the impact of waste/ dirt/ dust/unwanted substances on the process/ environment/ machinery/ human body</p> <p>KB14. have knowledge of best and environment protective ways of cleaning & waste disposal</p> <p>KB15. understand the importance of standardization in processes</p> <p>KB16. understand the importance of sustainability in 5S</p> <p>KB17. have knowledge of TQM process</p> <p>KB18. have knowledge of various materials and storage norms</p> <p>KB19. understand visual controls, symbols, graphs etc.</p>
Skills (S)w.r.t. the scope	
Element	Skills
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA12. write basic level notes and observations</p> <p>SA13. note down observations (if any) related to the process</p> <p>SA14. write information documents to internal departments/ internal teams</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA15. read 5S instructions put up across the plant premises</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA16. effectively communicate information to team members inform employees in the plant and concerned functions about 5S</p> <p>SA17. question the process head in order to understand the 5S related issues</p> <p>SA18. attentively listen with full attention and comprehend the information given by the speaker during 5S training programs</p>
B. Professional Skills	Judgmental Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB10. use common sense and make judgments during day to day basis</p> <p>SB11. use reasoning skills to identify and resolve basic problems using</p>

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	5S
	Persuasion
	The user/ individual on the jobs needs to know and understand how to: SB12. persuade team members to follow 5 S SB13. ensure that the team members understand the importance of using 5 S tool
	Creativity
	The user/individual on the job needs to know and understand how to : SB14. use innovative skills to perform and manage 5 S activities at the work desk and the shop floor SB15. exhibit inquisitive behaviour to seek feedback and question on the existing set patterns of work emerge, techniques in CA/CI around 5 S work practices
	Self -Discipline
	The user/individual on the job needs to know and understand how to: SB16. do what is right, not what is a popular practice SB17. follow shop floor rules& regulations and avoid deviations SB18. lead by example in the plant premises while performing activities related to 5S SB19. ensure self-cleanliness on a daily basis SB20. demonstrate the will to keep the work area in a clean and orderly manner
	Ownership
	The user/individual on the job needs to know and understand how to: SB21. accept additional responsibility for self and the team SB22. encourage self and other to take greater responsibilities for managing 5S SB23. identify obstacles and bottlenecks in the process and find basic level solutions for removing these obstacles
	Decision making
	The user/individual on the job needs to know and understand how to: SB24. use previous experience in resolving problems and taking decisions SB25. make timely and independent decisions on the line/ shift within the boundaries of the delegation matrix of the organization

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NOS Version Control

NOS Code	ASC/N0022		
Credits(NSQF)	TBD	Version number	1
Industry	Automotive	Drafted on	1/03/2014
Industry Sub-sector	Manufacturing/ R&D	Last reviewed on	15/03/2014
Occupation	All	Next review date	15/03/2016

