



Common Competency Model

We deliver world-class learning and development opportunities, and identify, maintain, and advance critical knowledge that empowers NASA to attain successful outcomes across missions and projects.



Overview

Through its world-class training curriculum, knowledge-sharing initiatives, development resources, and strategic communications, the Academy of Program/Project & Engineering Leadership (APPEL) Knowledge Services helps ensure NASA's technical workforce has the skills and knowledge needed to advance mission success.

Competencies are the foundation of training and developing project and program managers. NASA APPEL Knowledge Services developed the Project Management and Systems Engineering Competency Models to support the professional development of NASA's technical workforce. These are the 14 competencies that are common to both project managers and systems engineers. They are categorized into 5 general areas. Regularly reviewing and assessing competencies will help determine where skill gaps exist and need to be addressed.



Competency Model Categories

C 1.0 NASA Internal & External Environments

C 1.1 Agency Structure, Mission, & Internal Goals
Management

C 1.2 NASA Project Management/Systems Engineering
Procedures and Guidelines

C 1.3 External Relationships

C 2.0 Human Capital Management

C 2.1 Staffing & Performance

C 2.2 Team Dynamics and Management

C 3.0 Security, Safety, & Mission Assurance

C 3.1 Security

C 3.2 Workplace Safety

C 3.3 Safety & Mission Assurance

C 4.0 Professional and Leadership Development

C 4.1 Mentoring & Coaching

C 4.2 Communication

C 4.3 Leadership

C 4.4 Ethics

C 5.0 Knowledge Management

C 5.1 Knowledge Capture & Transfer

C 5.2 Knowledge Sharing



Common Competency Model

C 1.0 - NASA INTERNAL & EXTERNAL ENVIRONMENTS				
Definition	Understanding the three main components of NASA’s Internal and External Environments—agency structure, mission, and internal goals; understanding NASA project management/systems engineering procedures and guidelines; and understanding NASA's external relationships.			
C 1.1 - Agency Structure, Mission, and Internal Goals				
Definition	Understanding and successfully adapting work approach and style to NASA’s functional, social, cultural, and political structure and interrelationships to achieve Agency, Mission, Directorate, Center, program, and project goals. Includes aligning activities with the agency’s vision, mission, objectives, goals, and plans.			
Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none">Participates as a project team member to gain an overall understanding of the agency structure, mission, and internal goals and to gain initial experience in the competency.	<ul style="list-style-type: none">Leads teams intact and at a subsystem level) in the execution of the agency structure, mission, and internal goals.Provides guidance and expertise to team members, assisting in resolving issues.	<ul style="list-style-type: none">Leads teams at the project level in the execution of the agency structure, mission, and internal goals.Provides guidance and expertise at the project level to resolve issues.	<ul style="list-style-type: none">Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with the highest level internal, external, and international contacts.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to describe, identify, or define:</p> <ul style="list-style-type: none"> • The agency's structure, goals, mission, plans, and objectives. • How to align technical activities and metrics with vision, missions, plans, and objectives for both the agency and the center(s) involved 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> • Perform project management and/or systems engineering activities within the agency structure and across programs, centers, and NASA to achieve project subsystem goals. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> • Lead and manage project management and/or systems engineering activities to achieve goals within the agency structure and across programs, centers, and NASA • Understand the impact of legal, government, and jurisprudence requirements 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> • Establish program/project and/or systems engineering requirements needed to achieve goals and mission success within the agency structure. • Establish the center's program/technical requirements and infrastructure to be aligned with the agency structure.
Underlying Skills	<ul style="list-style-type: none"> • Leadership • Strategic thinking • Win-win negotiations • Working in teams 			

**Fundamental Knowledge of**

- Agency and project mission, goals, and objectives
- Political, economic, and other factors that influence agency goals

C 1.2 - NASA Project Management/Systems Engineering Procedures and Guidelines

Definition	Structuring activities to comply with relevant agency and center processes and guidelines including NASA Procedural Requirements (NPR) 7120.5 and NPR 7123.1.			
Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none">• Participates as a project team member to gain an overall understanding of the NASA project management and/or systems engineering procedures and to gain initial experience in the competency.	<ul style="list-style-type: none">• Leads teams (intact and at a subsystem level) in the execution of the project management and/or systems engineering processes.• Provides guidance and expertise to team members, assisting in resolving issues.	<ul style="list-style-type: none">• Leads teams at the project level in the execution of the project management and/or systems engineering processes.• Provides guidance and expertise to resolve project issues.	<ul style="list-style-type: none">• Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with the highest level of internal, external, and international contacts.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to describe, identify, or define:</p> <ul style="list-style-type: none"> NASA's project management and systems engineering policies and guidelines as outlined in NASA procedures and guideline documents. Center project management and systems engineering policies and guidelines as outlined in center procedures and guideline documents. 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> Structure and manage subsystem activities to comply with NASA and center project management and/or systems engineering guidelines. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> Structure and manage project activities to comply with NASA and center project management and systems engineering guidelines. 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> Establish the requirements for activities that comply with the project management and systems engineering policies and guidelines for the agency and center(s) involved. Lead the review and development of program/project management and systems, engineering policies, and guidelines to ensure mission success. Support policies as they pertain to the agency and center(s) involved.



Underlying Skills	<ul style="list-style-type: none">• Leadership• Strategic thinking• Win-win negotiations• Working in teams
Fundamental Knowledge of	<ul style="list-style-type: none">• Agency mission, goals, and objectives• Legal, government, and jurisprudence• Project management procedures and requirements• Systems engineering procedures and requirements

C 1.3 - External Relationships

Definition	Maintaining cognizance of the policies and procedures of other organizations by participating in professional societies/ organizations, contributing to professional development activities, researching best practices from external sources such as industry standards, procedures, and regulations and universities, and developing international partnerships and agreements, where applicable, complying with ITAR and as well as international agreements and standards.
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Role	Team Practitioner/Discipline Engineer	Team Lead/Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none"> Participates as a project team member to gain an overall understanding of external relationships and to gain initial experience in the competency. 	<ul style="list-style-type: none"> Leads teams (intact and at a subsystem level) in developing and maintaining external relationships. Provides guidance and expertise to team members, assisting in resolving issues. 	<ul style="list-style-type: none"> Leads teams at the project level in developing and maintaining external relationships. Provides guidance and expertise at the project level, resolving project issues. 	<ul style="list-style-type: none"> Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with the highest level of internal, external, and international contacts.
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to describe, identify, or define:</p> <ul style="list-style-type: none"> International partnerships, agreements, standards, and ITAR as they relate to the team's activities. 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> Contribute to the activities of professional societies and/or organizations. Maintain current knowledge of state-of-the-field research and key individuals. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> Demonstrate complete compliance with ITAR and international agreements and standards as they relate to the project. 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> Contribute knowledge and up-to-date research in their discipline. Comply with ITAR and international agreements and standards as they relate to the program. Establish program requirements that conform to industry and professional standards, procedures, and regulations.



Role	Team Practitioner/Discipline Engineer	Team Lead/Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations		<ul style="list-style-type: none"> Manage subsystem activities in compliance with ITAR and international agreements and standards. 	<ul style="list-style-type: none"> Participate in leadership roles within professional societies and/or organizations. 	
Underlying Skills	<ul style="list-style-type: none"> Leadership Strategic thinking Win-win negotiations Working in teams 			
Fundamental Knowledge of	<ul style="list-style-type: none"> Agency mission, goals, and objectives Federal ITAR regulations Legal, government, and jurisprudence 			

**C 2.0 – HUMAN CAPITAL MANAGEMENT**

Definition	Managing all team personnel elements to achieve a coherent, efficient, and effective project team including identifying, recruiting, selecting, managing, and evaluating team members.
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C 2.1 – Staffing and Performance

Definition	Managing all elements of personnel management, including identifying, recruiting, selecting, managing, and evaluating the team members to achieve a coherent, efficient, and effective team. This includes vigorous open communications, decision-making processes, and working relationships.
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Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none">Participates as a project team member to gain an overall understanding of the staffing and performance activities and to gain initial experience in the competency.	<ul style="list-style-type: none">Leads teams (intact and at a subsystem level) in the execution of staffing and performance activities.Provides guidance and expertise to team members, assisting in resolving issues.	<ul style="list-style-type: none">Leads teams at the project level in the execution of the staffing and performance activities.Provides guidance and expertise at the project level, resolving project issues.	<ul style="list-style-type: none">Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with the highest level internal, external, and international contacts.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to describe, identify, or define:</p> <ul style="list-style-type: none"> • The roles and responsibilities of team members. • How they can monitor their own performance level. 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> • Define team members' roles and responsibilities. • Monitor the performance of subsystem team members. • Apply appropriate team management techniques and concepts to guide a qualified team toward maintaining the desired performance level for a subsystem or simple project. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> • Integrate the team responsibilities and roles for each member. • Monitor the performance of subsystem leads. • Assemble teams with complementary talents and necessary skills, expertise, and experiences. • Establish the desired performance level and criteria of the system's workforce. 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> • Identify and assemble the required leadership personnel resources for a program. • Establish performance criteria for a program's workforce to ensure mission success. • Establish the agency's workforce personnel and infrastructure requirements to ensure mission success.



Underlying Skills	<ul style="list-style-type: none">• Ethics• Leadership• Strategic thinking• Win-win negotiations• Working in teams
Fundamental Knowledge of	<ul style="list-style-type: none">• Agency and project mission, goals, and objectives• NASA and contractor workforce policies and practices• Project architectures and concepts• Political, economic, and other factors that influence project goals

C 2.2 – Team Dynamics and Management

Definition	Managing the team aspects of the workforce. This requires working cooperatively with diverse team members; designing, facilitating, and managing team processes; developing and implementing strategies to promote team morale and productivity; motivating and rewarding team members' performance; managing relationships among team members, customers, stakeholders, and partners; and facilitating brainstorming sessions, conflict resolution, negotiation and problem-solving, communication, collaboration, integration, and team meetings.
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Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none"> Participates as a project team member to gain an overall understanding of aspects of team dynamics and management and to gain initial experience in the competency. 	<ul style="list-style-type: none"> Leads teams (intact and at a subsystem level) in team dynamics and management aspects of the project. Provides guidance and expertise to team members, assisting in resolving issues. 	<ul style="list-style-type: none"> Leads teams at the project level in team dynamics and management aspects of the project. Provides guidance and expertise at the project level, resolving project issues. 	<ul style="list-style-type: none"> Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with the highest level of internal, external, and international contacts.
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to describe, identify, or define:</p> <ul style="list-style-type: none"> The relationship between team members, customers, stakeholders, and partners. How to work within the team's communication, collaboration, and integration dynamics. 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> Apply appropriate team management techniques and concepts to effectively develop and motivate a team. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> Explain the team's direction and focus in order to maximize mission success. Manage the relationships and interfaces among team members and the project's customers, stakeholders, and partners. 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> Establish an incentive program to enhance the performance and productivity of the program's workforce teams. Develop and maintain positive relationships among the program's leadership team to ensure mission success.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
		<ul style="list-style-type: none"> • Manage the relationships and interfaces among team members and the customers, stakeholders, and partners as they pertain to a subsystem or simple project. • Plan and facilitate effective team meetings. 	<ul style="list-style-type: none"> • Create a team environment that fosters opportunities to conduct activities for brainstorming, conflict resolution, negotiation, and problem-solving. 	<ul style="list-style-type: none"> • Identify and manage the interfaces and relationships among the stakeholders and partners that may impact program and mission success. • Plan and facilitate effective leadership team meetings for the program.
Underlying Skills	<ul style="list-style-type: none"> • Clear communications • Interpersonal • Leadership • Strategic thinking • Win-win negotiations • Working in teams 			
Fundamental Knowledge of	<ul style="list-style-type: none"> • Project mission, goals, and objectives • Project organization and team makeup • Political, economic, and other factors that influence project goals 			



C 3.0 – SECURITY, SAFETY, AND MISSION ASSURANCE

Definition	<p>Security: Assuring that all proprietary, classified, and privileged information is protected from unauthorized use and dissemination. Also requires the identification of information and security requirements and the development and implementation of an effective IT security plan.</p> <p>Safety and Mission Assurance: Activities associated with assuring the safety of personnel and property and the success of the project. These activities include Environmental Impact Statements; hazards analyses, elimination, and mitigation; mishap investigations; failure review boards; the flight safety review process; and safety, mission assurance, and risk management plans.</p>
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C 3.1 – Security

Definition	Assuring that all proprietary, classified, and privileged information is protected from unauthorized use and dissemination. Also requires the identification of information and security requirements and the development and implementation of an effective IT security plan.			
Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none"> Participates as a project team member to gain an overall understanding of the security aspects of a project and to gain initial experience in the competency. 	<ul style="list-style-type: none"> Leads teams (intact and at a subsystem level) in the formulation and execution of the security aspects of the project. Provides guidance and expertise to team members assisting in resolving issues. 	<ul style="list-style-type: none"> Leads teams at the project level in the formulation and execution of the security aspects of the project. Provides guidance and expertise at the project level, resolving project issues. 	<ul style="list-style-type: none"> Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with the highest level internal, external, and international contacts.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to describe, identify, or define:</p> <ul style="list-style-type: none"> • The security requirements related to the subsystem. • How subsystem security plans will impact the subsystem and the teams' activities. 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> • Identify the security requirements for the subsystem. • Develop and implement the security plan for the subsystem. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> • Identify the security requirements for the system. • Develop and implement the security plan for the system. 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> • Direct the activities of Project Managers/Project Systems Engineers in relation to this competency. • Establish the security requirements for the program.
Underlying Skills	<ul style="list-style-type: none"> • Leadership • Strategic thinking • Win-win negotiations • Working in teams 			
Fundamental Knowledge of	<ul style="list-style-type: none"> • Project mission, goals, and objectives • Project architectures and concepts • Agency and national security regulations • Political, economic, and other factors that influence project goals 			



C 3.2 – Workplace Safety

Definition	Ensuring that workplace safety is an integral part of developing products by applying systems safety analysis techniques throughout the project life cycle and integrating critical hazard elimination/mitigation measures into risk management and safety plans.			
Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none">• Participates as a project team member to gain an overall understanding of the aspects of workplace safety and to gain initial experience in the competency.	<ul style="list-style-type: none">• Leads teams (intact and at a subsystem level) in the identification and management of workplace safety.• Provides guidance and expertise to team members, assisting in resolving issues.	<ul style="list-style-type: none">• Leads teams at the project level in the identification and management of workplace safety.• Provides guidance and expertise at the project level, resolving project issues.	<ul style="list-style-type: none">• Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with the highest level internal, external, and international contacts.
Proficiency Illustrations	Team Practitioners/Discipline Engineers should be able to describe, identify, or define: <ul style="list-style-type: none">• Factors that affect the safety of the public, astronauts, workforce, and capital.	Team Leads/Subsystem Leads should be able to: <ul style="list-style-type: none">• Identify, describe, and define the application of systems safety analysis techniques throughout the project life cycle.	Project Managers/Project Systems Engineers should be able to: <ul style="list-style-type: none">• Identify, describe, and define the requirements for project life cycle systems safety.	Program Managers/Chief Engineers should be able to: <ul style="list-style-type: none">• Review and approve program safety plans.• Lead a mishap investigation or failure review board.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations	<ul style="list-style-type: none"> • Factors that affect safety in the workplace while developing products. • Flight safety review process and preparation, review, or approval of project safety and quality management plans. • The Certificate of Flight Readiness (CoFR) process. 	<ul style="list-style-type: none"> • The process by which hazard levels are assigned and mitigation plans are implemented. • Additionally, Team/Subsystem leads must demonstrate experience in the following situations: <ul style="list-style-type: none"> • A mishap investigation or failure review board. • The flight safety review process. • The preparation, review, or approval of project safety and quality management plans. 	<ul style="list-style-type: none"> • Identify, describe, and define the processes for evaluating the adequacy of system safety analysis reports and mitigation plans. • Review and integrate system safety analyses and hazard elimination/ mitigation recommendations into a project risk management plan. • Evaluate and approve hazard elimination/ mitigation measures. • Coordinate inputs for Certificate of Flight Readiness (CoFR). • Formulate innovative safety plans for project situations that have no precedents or established plans. 	<ul style="list-style-type: none"> • Play a leadership role in the flight safety review process and preparation, review, or approval of project safety and quality management plans. • Develop safety plans for complex systems in challenging environments and with severe consequences for failure.



Underlying Skills	<ul style="list-style-type: none">• Clear communications• Leadership• Strategic thinking• Working in teams
Fundamental Knowledge of	<ul style="list-style-type: none">• Project mission, goals, and objectives• Project architectures and concepts• Agency and federal safety regulations Political, economic, and other factors that influence project goals

C 3.3 – Safety and Mission Assurance

Definition	Activities associated with assuring the safety of personnel and property and the success of the project. These activities include: Environmental Impact Statements; hazards analyses, elimination, and mitigation; mishap investigations; failure review boards; the flight safety review process; and safety, mission assurance, and risk management plans.
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Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none"> Participates as a project team member to gain an overall understanding of the SMA process and to gain initial experience in the competency. 	<ul style="list-style-type: none"> Leads teams (intact and at a subsystem level) in the execution of the SMA process. Provides guidance and expertise to team members, assisting in resolving issues. 	<ul style="list-style-type: none"> Leads teams at the project level in the execution of the SMA process. Provides guidance and expertise at the project level, resolving project issues. 	<ul style="list-style-type: none"> Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with the highest level internal, external, and international contacts.
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to describe, identify, or define:</p> <ul style="list-style-type: none"> Relevant safety regulations/procedures and activities for a subsystem. The process by which potential subsystem hazards are assessed. 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> Identify relevant safety regulations/procedures. Assess potential hazards. Monitor and control, eliminate, or reduce identified hazards. Perform subsystem safety analysis. Identify and manage the test safety for the subsystem. Verify subsystem safety. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> Lead and manage the system safety planning and implementation for a system. Review subsystem safety plans and implementation for the program. Identify mission assurance requirements for the system. 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> Lead and manage the system safety planning and implementation for a system. Review subsystem safety plans and implementation for the program. Identify mission assurance requirements for the system.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations	<ul style="list-style-type: none"> • The process by which mission assurance requirements are identified. • The process by which system safety analysis is performed. • The process by which system safety is verified. • The process by which failures are resolved and reported. 	<ul style="list-style-type: none"> • Conduct failure resolution and reporting. 	<ul style="list-style-type: none"> • Lead activities to prepare the system for and participate in safety and mission assurance readiness reviews, program audit and review processes, and Certificate of Flight Readiness (CoFR) process. 	<ul style="list-style-type: none"> • Lead activities to prepare the system for and participate in safety and mission assurance readiness reviews, program audit and review processes, and Certificate of Flight Readiness (CoFR) process.
Underlying Skills	<ul style="list-style-type: none"> • Clear communications • Leadership • Strategic thinking • Win-win negotiations • Working in teams 			
Fundamental Knowledge of	<ul style="list-style-type: none"> • Project mission, goals, and objectives • Project architectures and concepts • SMA organization and practices <p>Political, economic, and other factors that influence project goals</p>			

**C 4.0 – PROFESSIONAL AND LEADERSHIP DEVELOPMENT****Definition**

Supporting the development of professional and leadership qualities among all members of the program/project team. This includes mentoring and coaching; supporting NASA culture and functional training opportunities; managing oral and written communication to ensure all individuals are aware of status and decisions that affect them; recognizing and rewarding individuals for their personal achievements; and behaving ethically and complying with federal government policies at all times.

C 4.1 – Mentoring and Coaching**Definition**

Activities designed to help less experienced members of the team to advance their knowledge and careers by acting as an advisor, sponsor, or confidant who shares knowledge about NASA's functional, social, cultural, and political aspects or provides counseling to cultivate skills in order to enhance individual, team, and organizational performance and growth.

Role**Team Practitioner /
Discipline Engineer****Team Lead /
Subsystem Lead****Project Manager /
Project Systems
Engineer****Program Manager /
Chief Engineer****Proficiency
Level**

- Participates as a project team member to gain an overall understanding of mentoring and coaching aspects and to gain initial experience in the competency.

- Provides mentoring and coaching to the subsystem team.
- Provides guidance and expertise to team members, assisting in resolving issues.

- Provides mentoring and coaching at the project level.
- Provides guidance and expertise at the project level, resolving project issues.

- Provides mentoring and coaching at the program level and maintains relationships with the highest level internal, external, and international contacts.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to:</p> <ul style="list-style-type: none"> Secure their own mentor(s) or coach(es) to receive advice and guidance. 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> Serve as coach or mentor to at least one individual. Apply coaching and/or mentoring skills to improve or sustain the performance of team members for a simple project or subsystem. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> Establish a coaching and mentoring climate within the project team. Advocate for and support coaching and mentoring resources for their project team members. 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> Provide coaching or mentoring to members of the project team. Encourage coaching and mentoring within the project team.
Underlying Skills	<ul style="list-style-type: none"> Coaching and mentoring Leadership Strategic thinking Win-win negotiations Working in teams 			
Fundamental Knowledge of	<ul style="list-style-type: none"> Agency mission, goals, and objectives Political, economic, and other factors that influence project goals 			



C 4.2 – Communication

Definition	Implementing effective strategies for clear and constructive communication, both internally within the team and externally to stakeholders, other experts, contractors, and others. Also involves communicating decisions in a timely manner.			
Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none">Participates as a project team member to gain an overall understanding of the aspects of communication on projects and to gain initial experience in the competency.	<ul style="list-style-type: none">Leads teams (intact and at a subsystem level) in ensuring reports and other informational material are clear and communicated to internal teams.Provides guidance and expertise to team members, assisting in resolving issues.	<ul style="list-style-type: none">Leads teams at the project level in ensuring reports and other informational material are clear and communicates to project teams.Provides guidance and expertise at the project level, resolving project issues.	<ul style="list-style-type: none">Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with the highest level internal, external, and international contacts.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to:</p> <ul style="list-style-type: none"> • Develop their ability to effectively present technical and non-technical information both verbally and in writing. • Develop their ability to effectively present technical and non-technical information in formal and informal settings. 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> • Review Team Practitioners'/ Discipline Engineers' reports for accuracy and clarity. • Write and present reports that effectively communicate technical status, challenges, problem solutions, and/or accomplishments for a subsystem in order to provide a comprehensive account of a particular phenomenon. • Design and facilitate effective team meetings to reduce errors and redundancies. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> • Review Team/Subsystem Leads' reports for accuracy and clarity. • Lead and manage the presentation of information and decisions relating to the project's/ system's activities. • Lead and manage the development and presentation of reports that clearly and concisely communicate the results of technical assessments 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> • Define the communication procedures for their program. • Develop and present clear and concise reports to agency and center management. • Establish and maintain an environment characterized by positive communication.



Underlying Skills	<ul style="list-style-type: none">• Clear communications• Leadership• Strategic thinking• Win-win negotiations• Working in teams
Fundamental Knowledge of	<ul style="list-style-type: none">• Project mission, goals, and objectives• Team organization and makeup• Stakeholder expectations• Political, economic, and other factors that influence project goals



C 4.3 – Leadership

Definition	Influencing, inspiring, and motivating individuals and teams to accomplish goals; creating conditions in which individuals and teams can be effective; and recognizing and rewarding individual and team achievements.			
Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none">• Participates as a project team member to gain an overall understanding of leadership behaviors and to gain initial experience in the competency.	<ul style="list-style-type: none">• Leads teams (intact and at a subsystem level) in the execution of project activities.• Provides guidance and expertise to team members, assisting in resolving issues.	<ul style="list-style-type: none">• Leads teams at the project level in the execution of project activities. Provides guidance and expertise at the project level, resolving project issues.• Assigns, delegates, and periodically reassesses technical tasks/work assignments.• Establishes and evaluates progress towards success criteria for technical tasks/work assignments.	<ul style="list-style-type: none">• Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with highest level internal, external, and international contacts.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to describe, identify, or define:</p> <ul style="list-style-type: none"> • How influence, motivation, and vision are related to project success. • The relationship between leading and managing. • In addition, Technical Practitioners/Discipline Engineers are expected to track and manage their own performance. 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> • Assign, delegate, and periodically reassess technical tasks/work assignments. • Establish and evaluate progress toward success criteria for technical tasks/work assignments. • Provide vision, direction, and guidance for work activities. • Motivate and inspire Team Practitioners/Discipline Engineers. • Establish and maintain a collaborative work environment within the subsystem team. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> • Provide vision, direction, and guidance for work activities. • Motivate and inspire Team Practitioners/Discipline Engineers. • Establish and maintain a collaborative work environment within the subsystem team. 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> • Define success criteria for performing program technical tasks/work assignments. • Develop tasks/work assignments for the program leadership team. • Provide vision, direction, and guidance for program activities. • Empower leadership team members. • Establish and maintain an environment characterized by positive recognition, collaboration, consensus building, and the expression of minority opinion.



Underlying Skills	<ul style="list-style-type: none">• Clear communications• Leadership• Strategic thinking• Win-win negotiations• Working in teams• Change management• Creative thinking
Fundamental Knowledge of	<ul style="list-style-type: none">• Project mission, goals, and objectives• Project architectures and concepts• Scope of work• Political, economic, and other factors that influence project goals



C 4.4 – Ethics

Definition	Demonstrating integrity, ethical conduct, and acceptable behavior in all project activities in line with federal government principles.			
Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none"> Participates as a project team member to gain an overall understanding of ethical behaviors and to gain initial experience in the competency. 	<ul style="list-style-type: none"> Leads teams (intact and at a subsystem level) displaying ethical behavior. Provides guidance and expertise to team members, assisting in resolving ethical issues. 	<ul style="list-style-type: none"> Leads teams at the project level displaying ethical behavior. Provides guidance and expertise at the project level, resolving project issues. 	<ul style="list-style-type: none"> Leads overall effort displaying ethical behavior, resolves issues and maintains relationships with the highest level internal, external, and international contacts.
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to:</p> <ul style="list-style-type: none"> Tell the truth, whether delivering good news or bad news. Honor commitments and promises. Behave in a fair and consistent manner. 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> Follow federal government ethical conduct and services principles in all project activities. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> Demonstrate integrity and ethical performance in all project activities. 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> Create a culture of integrity and ethical performance.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations	<ul style="list-style-type: none"> • Accept responsibility for actions and admit mistakes. 			
Underlying Skills	<ul style="list-style-type: none"> • Clear communications • Leadership • Strategic thinking • Ethics • Win-win negotiations • Working in teams 			
Fundamental Knowledge of	<ul style="list-style-type: none"> • Project mission, goals, and objectives • NASA and federal regulations on ethics • Political, economic, and other factors that influence project goals 			



C 5.0 – KNOWLEDGE MANAGEMENT

Definition	Capturing, documenting, and sharing lessons learned and best practices in an organized fashion to reduce risk and improve performance on future programs/projects through the use of NASA processes and systems.
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C 5.1 – Knowledge Capture and Transfer

Definition	Identifying, capturing, evaluating, and transferring knowledge in an organized fashion to improve performance and reduce the risk associated with future programs, systems, and projects.			
Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level	<ul style="list-style-type: none"> Participates as a project team member to gain an overall understanding of knowledge capture and transfer practices and to gain initial experience in the competency. Actively seeks lessons learned and knowledge transfer from other project teams. 	<ul style="list-style-type: none"> Leads teams (intact and at a subsystem level) in the execution of the knowledge capture and transfer process. Provides guidance and expertise to team members, assisting in resolving issues. 	<ul style="list-style-type: none"> Leads teams at the project level in execution of the knowledge capture and transfer process. Provides guidance and expertise at the project level, resolving project issues. Actively supports the KM Plan implementation for project learning, reflection, and knowledge capture. 	<ul style="list-style-type: none"> Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with the highest level internal, external, and international contacts. Acts as KM Plan champion in support of all activities for project learning, reflection, and knowledge capture and transfer.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Level		<ul style="list-style-type: none"> Develops a Knowledge Management (KM) Plan that outlines knowledge sharing and transfer activities throughout the life of the project. 		
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to describe, identify, or define:</p> <ul style="list-style-type: none"> The importance and value of project learning in all stages of a project. Lessons learned/best practices from previous programs, projects, and significant studies. The steps to use NASA's Lessons Learned Information System (LLIS). 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> Communicate the value of project learning in all stages of a project. Provide access to subsystem work products to the appropriate users. Access relevant lessons learned applicable to the project over the life cycle of all project phases. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> Facilitate or plan project pause and learn sessions to capture lessons learned. Develop lessons learned case studies. Integrate the knowledge capture and transfer activities for their project. Elicit and document lessons learned. 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> Promote and require the effective application of lessons learned/best practices from previous programs, projects, and significant studies. Lead and support team knowledge transfer activities.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager / Chief Engineer
Proficiency Illustrations		<ul style="list-style-type: none">• Capture appropriate knowledge and trends relating to project management and engineering issues within the subsystem for input into a knowledge management system.• Contribute to knowledge capture activities such as pause and learn sessions, case studies, and knowledge-sharing forums.• Evaluate lessons learned/best practices from previous programs, projects, and significant studies.	<ul style="list-style-type: none">• Direct the activities conducted by Team/Subsystem Lead in relation to this competency.	<ul style="list-style-type: none">• Coordinate the development and maintenance of knowledge management systems that are useful for improving decision making, information sharing, and engineering issue resolution.• Establish proper knowledge management policy and processes.



Underlying Skills	<ul style="list-style-type: none">• Clear communications• Leadership• Strategic thinking• Win-win negotiations• Working in teams
Fundamental Knowledge of	<ul style="list-style-type: none">• Project mission, goals, and objectives• Project architectures and concepts• Team organization and make-up• Political, economic, and other factors that influence project goals

C 5.2 – Knowledge Sharing

Definition	Sharing organizational practices and approaches related to generating, capturing, and disseminating know-how and other content relevant to NASA's business and processes.			
Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager/Chief Engineer
Proficiency Level	<ul style="list-style-type: none">• Participates as a project team member to gain an overall understanding of knowledge-sharing practices and to gain initial experience in the competency.	<ul style="list-style-type: none">• Leads teams (intact and at a subsystem level) in knowledge sharing.• Implements KM Plan activities for knowledge sharing.	<ul style="list-style-type: none">• Leads teams at the project level in knowledge sharing in accordance with activities outlined in KM Plan.	<ul style="list-style-type: none">• Leads overall effort, reviews and approves products, resolves issues, and maintains relationships with the highest level internal, external, and international contacts.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager/Chief Engineer
Proficiency Level	<ul style="list-style-type: none"> Carries out KM Plan activities that support knowledge sharing. 	<ul style="list-style-type: none"> Provides guidance and expertise to team members, assisting in identifying knowledge to share. 	<ul style="list-style-type: none"> Provides guidance and expertise at the project level, resolving project issues. 	<ul style="list-style-type: none"> Acts as champion for all activities for knowledge sharing as outlined in the KM Plan.
Proficiency Illustrations	<p>Team Practitioners/Discipline Engineers should be able to describe, identify, or define:</p> <ul style="list-style-type: none"> The distinction between knowledge sharing and knowledge management. The distinction between tacit knowledge and explicit knowledge. Agency and center practices and resources for capturing and sharing tacit knowledge. 	<p>Team Leads/Subsystem Leads should be able to:</p> <ul style="list-style-type: none"> Design and facilitate team-based knowledge-sharing activities. Procure agency and center resources to support knowledge sharing. 	<p>Project Managers/Project Systems Engineers should be able to:</p> <ul style="list-style-type: none"> Apply knowledge-sharing activities to enhance project performance. Provide examples of the use and contributions of knowledge-sharing activities. Encourage the application of knowledge-sharing principles within their project. 	<p>Program Managers/Chief Engineers should be able to:</p> <ul style="list-style-type: none"> Define agency knowledge requirements, resources, and activities. Lead strategy to create a culture of knowledge capture and application of lessons learned/best practices.



Role	Team Practitioner / Discipline Engineer	Team Lead / Subsystem Lead	Project Manager / Project Systems Engineer	Program Manager/Chief Engineer
Proficiency Illustrations	<ul style="list-style-type: none">• The value and application of lessons learned/best practices.		<ul style="list-style-type: none">• Capture and share the project's tacit knowledge with other projects at the center and/or agency.• Contribute documented project lessons to be placed in the NASA/NEN LLIS across all phases of the project.• Know what agency resources best provide relevant knowledge to their project team.• Host knowledge sharing/lessons learned forums at the conclusion of projects.	



Underlying Skills	<ul style="list-style-type: none">• Clear communications• Leadership• Critical thinking• Systems thinking• Strategic thinking• Win-win negotiations• Working in teams• Facilitation and meeting management• Complex decision making• Executive presentation skills
Fundamental Knowledge of	<ul style="list-style-type: none">• Project mission, goals, and objectives• Team organization and make-up• Political, economic, and other factors that influence project goals