



Langley Research Center

# **Research and Development Classification Process Briefing for Grades GS 11 and 12**

March 2004

# Introduction

- President's Management Agenda calls for strategic management of Human Capital
- Research and Development skills are necessary to maintain Center's core competencies' ability to serve the public
- Aerospace Technologist (AST) 700 Group created by NASA to facilitate recruitment of scientists and engineers
  - RDCP ASTs are all in the 700 Group
  - Recognition of stature and appropriate pay for work are two retention methods
  - The two OPM Guides used for classification of AST, rank-in-person, positions recognize stature as critical
    - » Stature and contributions double weighted in one factor



# Evaluation Guides

Two OPM classification standards recognize rank-in-person for research and development positions

- Research Grade Evaluation Guide (RGEG) and Equipment Development Grade Evaluation Guide (EDGEG), Part 1, 2, or 3
- Each Guide has differently named position description factors across 2 or 4 factors but the information is basically the same across the factors
- RGEG (and EDGEG Part 3) - Used for 75% of RDCP positions
  - Four Factors
    - » Research situation or assignment
    - » Supervision received (span of control, authority, & influence)
    - » Originality
    - » **Qualifications and Contributions - double weighted**



# Determining Grade Level with the Guides

1. Factors of Position Description scored by assigning highest degree level fully met according to criteria in the appropriate Guide
2. Each Degree Level has corresponding points defined in the Guides
3. Total points scored determines overall Grade Level

Position Description
Factor 1
-----
Factor 2
-----
Factor 3
-----
Factor 4

VS.

RGEG
Factor 1 Criteria
Degree A,C, E, E+
-----
Factor 2 Criteria
Degree A,C, E, E+
-----
Factor 3 Criteria
Degree A,C, E, E+
-----
Factor 4 Criteria
Degree A,C, E, E+



Degree	A	B	C	D	E
Factor					
I	2	4	6	8	10
II	2	4	6	8	10
III	2	4	6	8	10
<b>IV</b>	<b>4</b>	<b>8</b>	<b>12</b>	<b>16</b>	<b>20</b>
Total	10	20	30	40	50



Grade	Total Points
<b>GS-11</b>	<b>8-12</b>
<b>GS-12</b>	<b>16-22</b>
<b>GS-13</b>	<b>26-32</b>
<b>GS-14</b>	<b>36-42</b>
<b>GS-15</b>	<b>46-52</b>



## Peer Review

- OPM Evaluation Guides recommend use of peer reviews for Rank-in-Person positions
  - Peers, rather than managers or OHR classification specialists alone, better understand the relevance of the contributions and stature in the field.
  - Managers still involved: advice, job duties, package preparation, interviews, early and deferred reviews
- Our RDCP modeled after processes used by other Agencies
  - Other Agencies and universities have used such peer review processes for several years
  - Uses peer panels to apply criteria specified by OPM classification standards for these positions
  - Delegated authority to do so by the Office of Human Resources and the Center Director.



## Research & Development Classification Process (RDCP) Characteristics

- A system designed to ensure that all employees in rank-in-person positions have accurately described and properly classified position descriptions
  - Used for R&T ASTs, GS 13 through GS 15
  - GS 11s and GS 12s use a modified process (Branch head and one reviewer rather than a panel)
- Clear and understandable to employees and managers, consistent across the Competencies, a published process, with published grade level criteria.
  - Published process in the LMS
- Satisfies requirements in NPG 3510.5B, “Position Classification”
  - Requires periodic position reviews for everyone, evaluation reports, and appeals



## Modifications to Research & Development Classification Process for Low Grades

- Modified peer panels used for GS-11s and GS-12s
  - Experience usually not extensive enough to need peer evaluation of standing and recognition in the field
  - These grade levels in the covered AST positions are considered career potential and not accretion of duties. (You already competed for a position that has a full potential of GS-13)
  - Branch Head and outside branch reviewer(s) serve as the “peer panel”
- Must also demonstrate ability to perform at higher grade levels (up to GS-13)
- Meet minimum time-in-grade and experience requirements
  - At least one year in grade
  - Education and/or Experience at the current grade level
- Reviews conducted at least annually
  - If can get budget allocated earlier in year, could hold more than one session each year

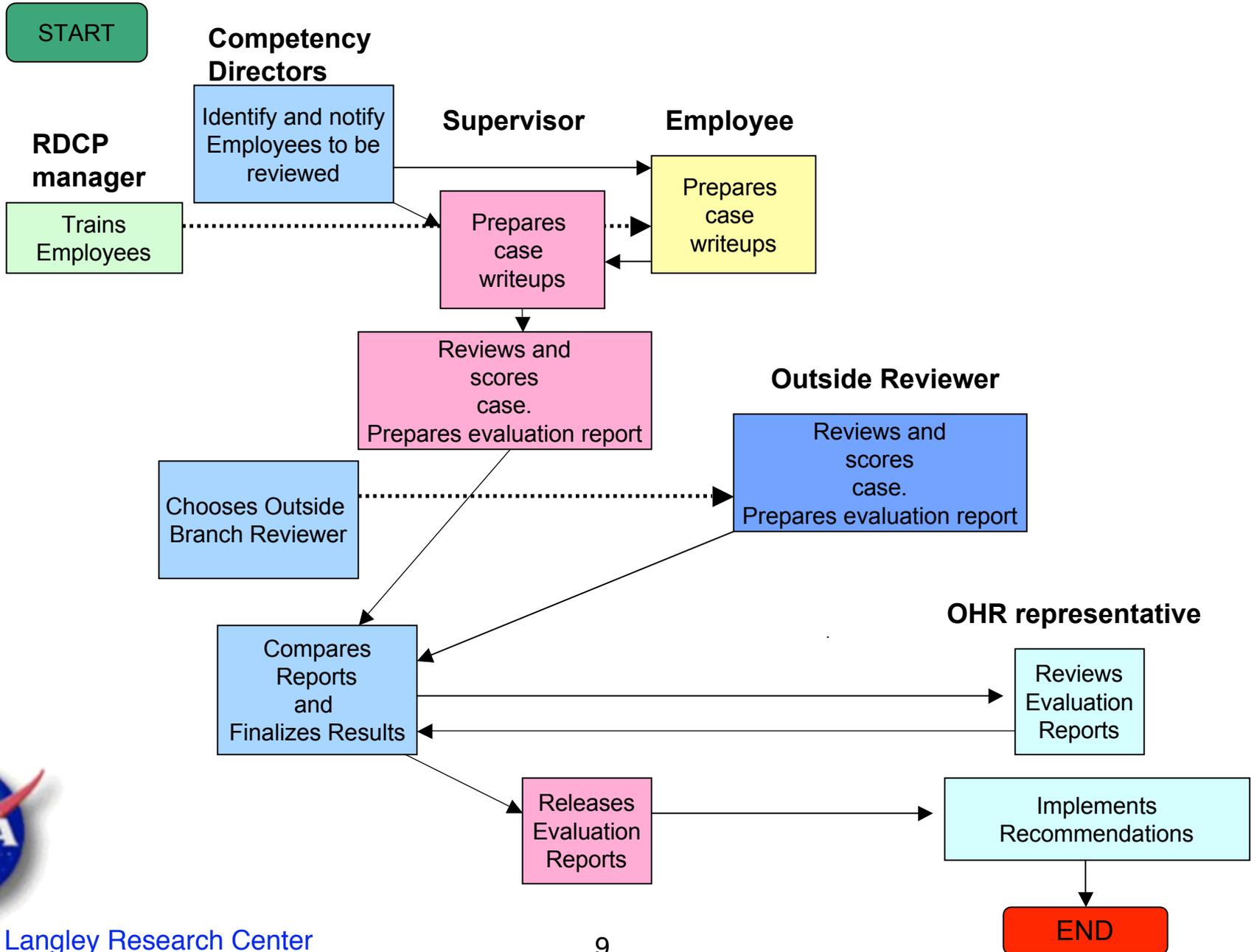


## RDCP Information and Contacts

- RDCP Manager -
  - Dr. Kelli Willshire, 864-1965, [k.f.willshire@larc.nasa.gov](mailto:k.f.willshire@larc.nasa.gov)
- OHR-RDCP Information Website
  - <http://ohr.larc.nasa.gov/RDCP.html>
- More information about RDCP also in LMS CP-0019 and the RDCP Guidance document found at <http://lms-p.larc.nasa.gov/>
- Time & Attendance FCS is 23-090-20-06



# Research and Development Low Grade Classification Process



## RDCP Reviewee Packages

- Reviewee and Branch Head prepare package
- Four parts:
  - Case Write-up Cover Sheet (LF 517)
    - » Signed by Reviewee and Branch Head certifying accuracy and completeness
  - Position Description based on RGEG or EDGEG
    - » Two or Four Factors
  - Employee Accomplishment Record (whole career)
    - » Substantiates the position description
  - Contact/Reference List
    - » Used to provide clarification and confirmation of package information
    - » Includes external references, if applicable to the position, of which at least one is contacted



# Evaluation Reports

- Final scores and narrative comments
- Includes rationale for assignment of scores; may include example(s)
- Report returned to employee for discussion with Branch Head
- Honest assessment important feature of Branch Head feedback



# Example Evaluation Report

## RGEG Position Evaluation Report

Researcher: Ted D. Baer

Peer Group: Aerodynamics and Acoustics

### Summary Scores

Factor I – Research Assignment	Factor II – Supervision Received	Factor III – Guidelines and Originality	Factor IV – Qualifications and Contributions
<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>

Total Score: 40

Grade Conversion: GS-14

#### Factor I – Research Assignment

*The reviewer assigned Degree D for this factor because:*

- The incumbent conducts pioneering research in shape memory alloys (SMA), a complex field with issues in many different discipline areas in which significant advances must be made for applications to be successful.
- Through individual research and the formation of cross-competency teams, the incumbent has laid the groundwork for advancements in many different aspects of the understanding and application of SMAs for the foreseeable future.
- The incumbent’s research has built LaRC’s SMA expertise from the ground up and is currently being expanded to include other engineers.
- The incumbent’s research has a number of important applications in a wide range of fields and has the potential to have a revolutionary impact in future aircraft. The potential applications of the research area are only beginning to be explored.
- The incumbent leads a model development team and provides technical leadership for a number of other teams that were formed by him based on identified research needs.

The incumbent exceeds the requirements of Degree C as evidenced by the above. The scope of this research area is not broad enough to assign Degree E.

#### Factor II – Supervision Received

*The reviewer assigned Degree D for this factor because:*

- The incumbent receives minimal technical supervision from his supervisor and has complete responsibility for formulating a research plan, enlisting and negotiating support of other organizations and directing the research plan.
- The incumbent is solely responsible for the technical direction of several research teams.
- The incumbent has full authority to represent SAB and LaRC in the incumbent’s areas of expertise both within and outside NASA. He is expected to disseminate research plans and findings directly to outside technical organizations.

The latter two meet criteria that exceed Degree C.





**Factor III – Guidelines and Originality**

*The panel assigned Degree D for this factor because:*

- There is limited prior research into SMA modeling upon which incumbent has been able to draw in his own research. Prior modeling efforts have not been of the appropriate physical scale or have been limited to incompatible applications. Due to limited physical understanding of SMAs they have seen little application in structural systems and previous efforts have had little prior concept development. However, there is an extensive body of knowledge concerning SMA properties in general.
- The research requires unique fabrication techniques and complex test techniques that are not used in other fields.
- The incumbent developed a brand new, validated constitutive model of SMAs. This constitutes a creative extension of an existing methodology that may one day supplant current models. He also developed a parallel program for the first SMA hybrid composite (SMAHC) structures fabricated by NASA. The SMA materials characterization research is the first within NASA. For this reason Degree C is exceeded.

**Factor IV – Qualifications and Contributions**

*The panel assigned Degree D for this factor because:*

- Through personal research and leadership and technical direction of teams, the incumbent's research has made significant advancements in SMA research:
  - The materials characterization effort has led to discovery of important material characteristics with significant modeling implications.
  - Thermomechanical cycle dependency has been studied and a method for automation of thermomechanical training of SMA actuators has been devised.
  - The incumbent developed methods for mass-producing SMA actuators to reduce processing time by a factor of 10.
  - The incumbent developed the only commercially viable process for embedding SMA actuators in laminated composite structures.
  - The incumbent's research has formed NASA's entire body of expertise in modeling, characterization, fabrication and testing of SMAs and the research is currently being expanded beyond what the incumbent has accomplished. Even though LaRC does not have a strong capability in adaptive structures, he has single-handedly made LaRC a world leader in SMA research.
  - Evidence of technical recognition and stature in the field:
  - Co-instructor for a short course.
  - Conference technical program committee, three conference technical session chairs.
- As evidenced by the above, Degree C is exceeded.

**General comments:**

The incumbent is motivated by the desire to stay ahead of the field and maintain research at the cutting edge. He is very receptive to suggested collaboration outside his organization and is good at breaking down cultural barriers that tend to limit collaboration between different structures branches. Continued rate of accomplishments at the current level allowing for the impact of his work to materialize over time should support further advancement.

## Policy for Borderline Cases

- **Borderline score** - Total score ends in a “4” for RGEG or EDGEG part 2, or is “ 12,17, 22, or 27” for EDGEG part 3.
  - **Grade**
    - » Stay at current grade, but denote in panel report that score is between grades.
    - » Issue report same time as all others using the web system
  - **Follow up for Borderline, below grade case**
    - » RDCP manager sends e-mail to Branch Head, with copy to Comp. Office to make sure he or she realizes the implications of a borderline score and refers him/her to the appropriate section in the RDCP Guidance Document.
      - If no appeal, this e-mail is sent after 30-day appeal request period.
      - If there is an appeal, wait until results are complete. Send e-mail if panel decision upheld.
    - » RDCP Guidance Document contains section advising Branch Head to review the situation to determine if there is erosion of duties (scope) or potential performance problem. OHR is available for assistance.
  - **Re-Review**
    - » Re-review no earlier than 12 months if significant progress is made. Re-review before regular cycle is a wild card for the Competency and is at their discretion. Same for borderline above or below grade.
    - » If borderline-below grade occurs for two consecutive reviews, case goes to OHR for review with branch head and actions outside of RDCP.



# Policy for Below Grade Cases

## – Grade

- » Stay at current grade, but denote in panel report that score is below current grade.
- » Report issued same time as all others using the web system

## – Follow up

- » RDCP manager sends e-mail to Branch Head, with copy to Comp. Office, to make sure he or she realizes the implications of a below grade score and refers him/her to the appropriate section in the RDCP Guidance document.
  - If no appeal, this e-mail is sent after 30-day appeal period.
  - If there is an appeal, wait until results are complete. Send e-mail if panel decision upheld.
- » RDCP Guidance document contains section explaining that OHR how will work with Branch Head to resolve issues. OHR sends a letter (after appeal, if any, is complete) to say that some action needs to take place and a meeting is set up to decide that action.

## – Re-Review

- » Mandatory re-review in 12-18 months after resolution plan completed. Not a wild card. Won't displace people originally assigned to that session.
- » If below grade score occurs for two consecutive reviews, case goes to OHR for other action.



## RDCP Reviewee Write-ups

- Four parts:
  - Case Write-up Cover Sheet (LF 517)
  - Position Description
  - Employee Accomplishment Record
  - In-depth Reviewer Contact List
- See RDCP Guidance Document for format info
  - <http://lms-p.larc.nasa.gov/>
- See RDCP website for write-up examples and Contact List template
  - <http://ohr.larc.nasa.gov/RDCP.html>
- Take signed, original and as many copies as requested to your Competency Office, including LF 517
  - Get LF 517 from LMS



## Position Descriptions

- Use RGEG or EDGEG Part 3 unless in Research Systems or Computer Systems peer groups
  - Four Factors
- EDGEG Part 1,2, or 3 used for Research Systems and Computer Systems peer groups
  - Two or Four Factors, depending on which Part used.
- Okay to use incumbent's name instead of generic



# Supervisory Review of Position Description

- Position Description must be certified by supervisor on Cover Sheet – description is accurate and current
- **Duties written to what is being performed – not what might be desired in the future or more advantageous in terms of grade. *Don't parrot the Guide without giving examples.***
- **Write you are doing and have done. Emphasize impacts of accomplishments. Evaluations are weighted on demonstrated rather than potential work.**
- Should cover regular and recurring assignment(s) that comprise significant amount of employee's time (three to four years)
- Meet with Branch Head soon if haven't already. Establish schedule to complete and review write-up.
- Proof read. Allows others to critique for understanding and completeness.
- Ask to see final write-up, if Branch Head to submit it for you.
- RDCP reviews are **not** Performance Reviews. Branch Head still does those.



## Definition of LaRC Research

- Research and development, as conducted at NASA Langley Research Center, includes high payoff activities beyond the risk limit or capability of commercial enterprises, which delivers validated technology and scientific knowledge.
- At one end of a continuum, it is very basic research, progressing through applied research, while at the other end, it is development and validation of new technology including demonstration and evaluation.
- Many of the positions at NASA Langley require progressing and iterating through many of the stages along this continuum depending upon the maturity level and goals of the assigned project.
- Application of the two Guides, RGEG and EDGE, should use this broader definition of “research.”



# Research Grade Evaluation Guide

- Covers positions of performing professionally responsible research or leadership of and participation in research team
- Fits these criteria
  - characterized by systematic investigation of aerospace engineering and atmospheric phenomena using experimental, simulations, or theoretical, and/or computational techniques.
  - characterized by application of scientific methods including problem exploration and definition, planning of the approach and sequence of steps, execution of experiments or studies, interpretation of findings, and documentation or reporting of findings.
- Four Factors
- Products typically associated with this kind of work include
  - Development of theories, principles, concepts, techniques, approaches, and processes
  - Results in papers, presentations, patents, inventions, etc
- Covers majority (75%) of the employees in RDCP



# Equipment Development Grade Evaluation Guide

- “Development”
  - advances state-of-the art and is the systematic application of scientific or engineering knowledge to create new or improved equipment, systems, materials, processes, techniques or procedures for a useful function
- Approach
  - Looks at Development Engineering in five major phases:
    - Phase I – Planning and Requirements
    - Phase II – Conceptual
    - Phase III – Definition
    - Phase IV – Prototype Design
    - Phase V – Test and Evaluation



## EDGE Position Descriptions

- Covers
  - positions engaged in planning, formulating, defining, monitoring, managing and evaluating governmental and contractor work for new or improved systems or equipment
- Equipment Development Guide contains three parts
  - Part I – Product Development
  - Part II – Project Management
  - Part III – Experimental Development
- Formats in each section are different
- Use the Part that covers the greatest majority of work performed in the position



# EDGEG Part I – Product Development

- Product Development –
  - Covers the work required during the planning, conceptual and definition phases of the development process
  - Also covers providing technical direction to contractors, evaluating contractor work, guiding in-house development work, and serving as consultant or advisor on research and development programs
    - » Includes studies and analysis in depth on selected areas
    - » Systems integration of others work
- Format
  - Factor I – Assignment characteristics
  - Factor II – Level of Responsibility



## EDGE G Part II – Project Management Engineering

- Covered positions report to a Project Manager
  - Managing development of equipment or systems for such projects for a Project Manager
  - Covers those who manage the combined efforts of contractors and Government agencies in support of development of equipment for a project
  - Includes duties such as preparing cost estimates, preparing schedules, participating in design reviews, and reviewing and assessing work efforts of contractors.
  - Applies to GS-12 and above.
    - » GS-11 positions do not typically involve the significant responsibilities in managing engineering aspects of a project nor require full scope of knowledge and abilities.



# EDGEG Part II – Project Management Engineering

- Qualifications

- Professional competence in engineering field

- Understands

- »Engineering and scientific principles and theories

- »Methods, practices, and techniques of development design

- »Criteria and characteristics underlying use and purpose of engineered items

- Format - Four Factors

- 1. Scope of the Assignment,

- 2. Technical Complexity of the Assignment,

- 3. Responsibility and Authority,

- 4. Technical and Managerial Demands



# Employee Accomplishment Record

- Details supporting the Factors 1,2, 3, and especially 4
- Total qualifications, professional standing and recognition, and contributions as impact current job
- If publications not appropriate, use other means to judge
- Recency of accomplishments important to show maintenance of competence
- Evidence that incumbent is keeping up with advancing and changing disciplines
- Educational degrees may be important, but not necessarily enough



# Employee Accomplishment Record

1. Name
2. Education
3. Relevant Professional Training Received
4. Professional Experience: \*

*Link to contacts on In-depth Review Contact Sheet*

- a. Present assignment

Dates

Brief description of duties and titles of projects

Name of supervisor

- b. Previous professional positions (within last 10 or so years)

Dates

List research, engineering, other technical positions

Provide brief description of work for each positions

**\* Note: Can combine information in items 4,5, and 6. See Alternate Format**



## Employee Accomplishment Record

### 5. Significant Scientific/Engineering/Technical Accomplishments:

*Link to contacts on In-depth Review Contact Sheet*

- a. Do not duplicate information in item 4
- b. Describe each accomplishment, including results, in a separate paragraph
  - (1) state the accomplishment
  - (2) significance
  - (3) how it was communicated to users
  - (4) the extent to which being applied

### 6. Scientific/Engineering/Technical Leadership:

*Link to contacts on In-depth Review Contact Sheet*

- a. Employee's contribution in leading, planning, coordinating
- b. Document effectiveness before and after employee's leadership
- a. Employee's contribution in leading, planning, coordinating
- b. Document effectiveness before and after employee's leadership



## Alternate format for Items 4, 5, & 6

- Optional format for items 4, 5, and 6 but must still provide the same information
- Start with present assignment and work back through time
- New section title
  - “Experience, Accomplishments, and Leadership, items 4,5,and 6.”
  - **Assignment 1** (Dates from/to), Project, Source of funding
    - Your specific role, including any team leadership
    - Content from items 4 and 6
  - » **Accomplishments**
    - for Assignment 1 described here
    - Content from item 5
  - » **Impact and Significance**
    - Of the accomplishments
    - Content from item 5



# Employee Accomplishment Record

7. Professional Scientific/Engineering/Technical Service:
  - a. Current membership in professional societies
  - b. Rendering scientific judgment
  - c. Special assignments or other outreach activities

10-page limit here

8. Inventions, Patents Held:
  - a. Identify inventions disclosed/patents held
  - b. Provide dates
9. Honors, Awards, Recognition, Elected Memberships
  - a. List honors, awards and recognition received
  - b. Provide date and name of organization for each



# Employee Accomplishment Record

## 10. Work Product List: [Number consecutively]

### a. Traditional Publications

Formal refereed publications (journal articles, NASA TPs)

Referenceable oral presentations

Others - NASA TM & CR and briefings not covered above

### b. System Study Reports

(Reference program or HQ customer, title, contributors, date)

### c. Hardware Products

Concept/Technology Development

Trade Studies

Designs

Component/Subsystem/Instrument Development

Integration, Test and Delivery



# Employee Accomplishment Record

## 10. Work Product List continued

### d. Software Products

Concept/Technology Development

Trade Studies

Designs

Code Implementation/Development

Integration, Test and Delivery

### e. External agreements

Positive Technology Transfer

Memoranda of Understanding and Memoranda of Agreement



# Contacts

- List individuals who can provide information regarding impact and accomplishments of employee's work
  - Program or project managers,
  - Peers, inside or outside LaRC
  - Contractors and retirees okay, but make sure relevant
- Contacts may be inside Langley or outside - other NASA organizations, universities, corporations
- Minimum of 3 names
- Contact first to ensure he/she is willing to provide reference
- Title, organization, e-mail address, phone number listed on contact sheet. Link contacts to accomplishments.



# The Guides



## RGEG and EDGEG Part 3 Position Description

- Factor I - *Research situation* or assignment
  - Nature, scope, difficulty and characteristics of current studies/activities
  - Based on a sufficient span of time to reflect the norm of current assignments rather than isolated and atypical projects (usually 3-4 years)
- Factor II - Supervision received
  - Guidance, control, authority and influence of the position
  - Current assignment
- Factor III - Guidelines and originality
  - Creative thinking and analysis that characterize the current work
  - Past examples
- Factor IV - Qualifications and *scientific* contributions
  - Focuses on the total qualifications, professional standing and contributions
  - Whole career, not just NASA



# RGEG and EDGEG (3) Factor 1

## Research situation or assignment

- Inherent DIFFICULTY and COMPLEXITY of the “research” problem determines the level assigned, not whether research is basic, applied, or prototype development - current assignment
- A - Organization
  - Title, series
  - Branch and Competency
  - Mission/function of organization
- B - Personal research/development assignment -
  - Current assignment in general terms; project as an example of problem to be solved
  - Include field of research/development
  - Describe individual role...include personal assignment(s) if a team leader
  - Scope, complexity, objectives, means of accomplishment, actual or expected end results and progress to date, impact on theory or practice, validation processes



## RGEG and EDGEG (3) Factor 1, continued

- C - Team leadership
  - If no lead responsibilities, state “The employee has no team leadership responsibilities”
  - If lead responsibilities
    - » describe project(s)
    - » nature, type, complexity, and impact of involvement
    - » problems being researched/product being developed, complexity
    - » numbers/types of team members
    - » technical leadership provided
    - » responsibilities to coordinate others’ work
    - » could include technical leadership for a particular aspect of project for the team
  - Based on personal competence in research rather than supervisory or administrative skill
  - Team leadership can be found at each degree level C, D, and E.



## RGEG and EDGEG (3) Factor 1, continued

- D - Related functions
  - Briefly summarize regularly assigned non-research/non-development duties involving 25 % or more of time (Usually, contract management considered part of the research assignment.)
  - Technical assistance, teaching, special assignments
  - Amounts of 25% or less need not be described
- E - Administrative responsibilities
  - Summarize if 25% or more of time
  - Amounts of 25% or less need not be described



## RGEG and EDGEG (3) Factor 2 Supervision received

- Effect of controls on the position - current assignment
  - Determining course of action of self and others
  - Degree of finality of recommendations and decisions, impacts on projects and programs
- A - Supervisory relationship
  - Identify supervisor and project leads
  - Outline degree of independence the employee uses to select problems to study, plan, execute, and report research/development. Explain at what level this occurs.
- B - Required approvals
  - Kinds of actions requiring approval from others. Who approves?
  - Examples - changes in scope of research/assignment, of self and others, funding or staffing project, etc.
- C - Delegated authority
  - Nature and extent of the employee's authority to speak or interface with others
  - Covers interaction with professionals and/or non-professionals
  - Impact of that authority on higher level decisions



## Clarification for Supervision Received Factor -

- RGEG or EDGEG Part 3, Factor 2 – Supervision Received
- More than branch head supervision. □
- General Considerations: Span of control, authority, and influence.
  - As one goes higher in degree level, more of this applies.

How much does the person have or do of these things?

- Responsibility for decision made on technical and nontechnical matters
- Plan, coordinate, and/or establish priorities
- Speak officially for the Government – at what level and to whom, includes representation on committees and seminars, etc.
- Authority to resolve critical or controversial issues – what kind and with whom?
- Negotiate agreements – what kind and with whom?
- Recommend courses of action. As go higher, recommendations are accepted with only formal approval action by others.
- Who provides or gives technical assistance – the supervisor or the reviewee? The reviewee at higher levels provides assistance and guidance to others. How much and to whom?

- By itself, not getting technical supervision from the Branch Head does not exceed Degree C.

- Do NOT parrot the Guide without providing examples and evidence.



## RGEG and EDGEG (3) Factor 3 Guidelines and Originality

- Degree to which guidelines are available and/or useful, and innovations in concepts, methods, and interpretations - address current assignments, but can have examples from past assignments
- A - Existing knowledge
  - Deals with degree of originality required and being applied
  - Guidance/literature available pertinent to research/development project
  - Nature and extent of employee's knowledge in the field and its usefulness as guidance
  - Gaps or inadequacies in existing literature or methodologies
- B - Originality required and applied
  - Degree of judgment required and applied in guide selection, interpretation, and adaptation
  - To make progress
  - Extend current theory or models
  - Intrinsic difficulty in applying guides



## RGEG and EDGEG (3) Factor 3, continued

- C - Demonstrated originality
  - Deals with how research/development activity added to existing state of knowledge
  - Scope and impact of research/development results and products
  - Local, regional, national, international impact
  - Can use examples from past assignments as long as relevant.



## **RGEG and EDGEG (3) Factor 4 Qualifications and Contributions**

- Includes brief statement of general qualifications and accomplishments present in the position
  - Summary description of qualifications of the reviewee
- Can be written in third person but in present tense
  - Incumbent has degree in X field and experience in Y.
- Factor IV is double weighted



# RGEG and EDGEG Part 3 Scoring

RGEG Degree Points

Degree	A	B	C	D	E
Factor					
I	2	4	6	8	10
II	2	4	6	8	10
III	2	4	6	8	10
IV	4	8	12	16	20
Total	10	20	30	40	50

Grade	Total Points
GS-11	8-12
GS-12	16-22
GS-13	26-32
GS-14	36-42
GS-15	46-52

EDGEG 3 Degree Points

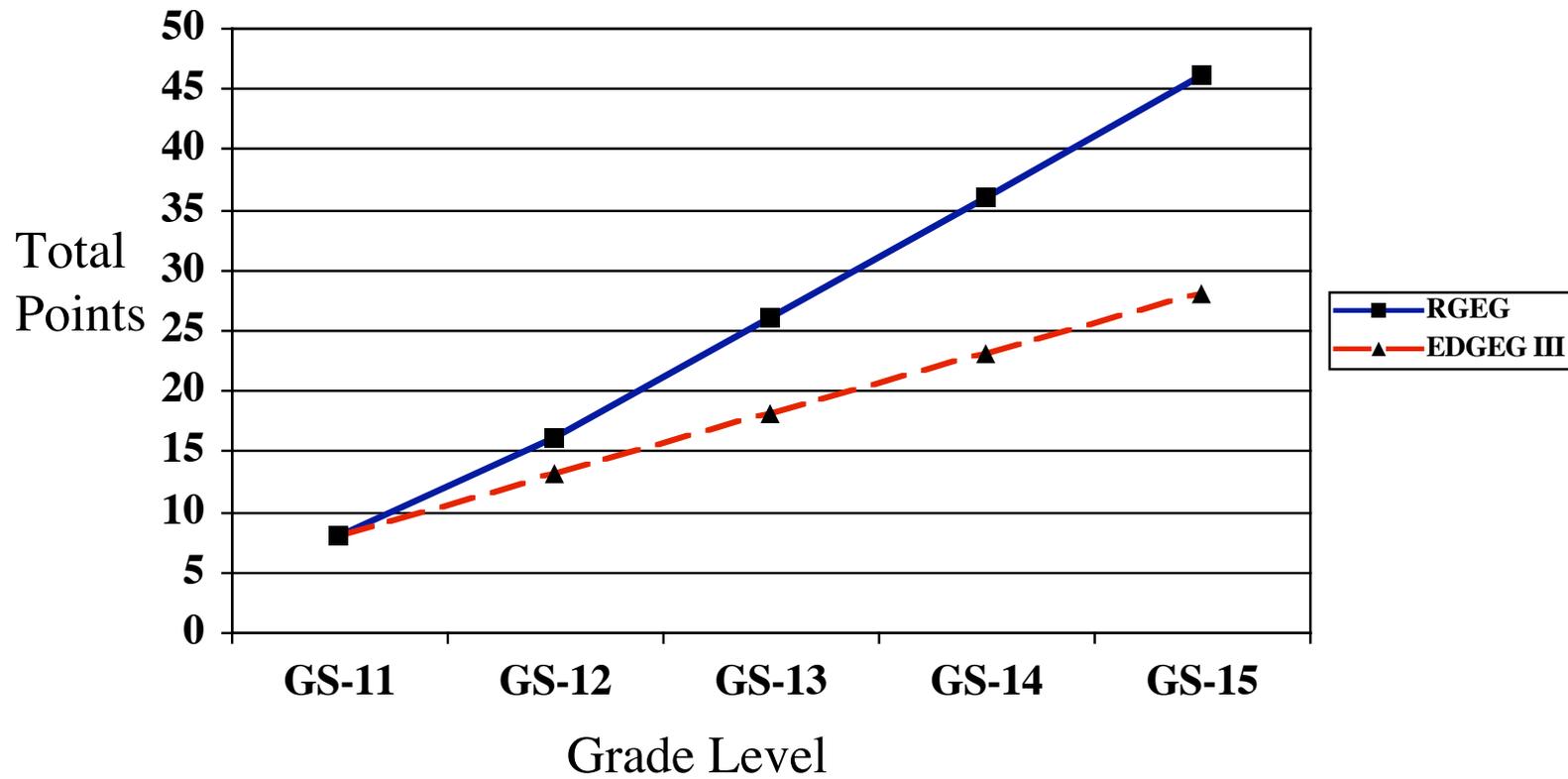
Degree	A	B	C	D	E
Factor					
I	1	2	3	4	5
II	1	2	3	4	5
III	1	2	3	4	5
IV	2	4	6	8	10
Total	5	10	15	20	25

Grade	Total Points
GS-11	8-11
GS-12	13-16
GS-13	18-21
GS-14	23-26
GS-15 <input type="checkbox"/>	≥ 28

Exceed E for Factor IV, or for two of the other three factors



# RGEG vs. EDGEG Scoring



# RGEG and EDGEG Part 3 Degree Definition Examples

## • Factor 1 - Assignment

### Degree A

- Limited scope, readily definable objectives, conventional techniques, all phases of research, improved method or technique, or addition to knowledge.

### Degree B

- Scope covers multiple studies or segments, definable objectives, modified conventional techniques, all phases of research, improved methods or techniques, or answers interesting scientific questions.

### Degree C

- Considerable scope and complexity: difficult to define, novel approaches, sophisticated technique, more than average difficulty. Series of studies. Important contribution to theory or methodology, changes to products, processes, or practices.

- Reviewers can use any Degree levels, A through E+ (See the Guide for full definitions of A, C, E, and E+)



# RGEG and EDGEG Part 3 Degree Definition Examples

- **Factor 2 - Supervision (Includes from project manager)**

## Degree A

- Supervisor assigns specific problem, maybe after incumbent suggests it. Incumbent assisted in problem definition and planning but responsible for completeness and adequacy, including reports. Major changes require immediate level management approval. Work reviewed by immediate level management for accuracy and completeness.

## Degree B

- Supervisor assigns general area. Incumbent selects specific problems and approaches, subject to immediate level management approval. Performs all research steps including reports. Work reviewed by immediate level management for accuracy and completeness. Supervisor or project manager sometimes follows incumbent's recommendations.

## Degree C

- Supervisor assigns broad problem area, substantial freedom in that area, identifies specific problems and approaches. Incumbent performs all steps of studies including reports. Supervisor or project manager generally follows incumbent's recommendations.

- Reviewers can use any Degree levels, A through E+

Langley Research Center (See the Guide for full definitions of A, C, E, and E+)



# RGEG and EDGEG Part 3 Degree Definition Examples

## • Factor 3- Originality

### Degree A

- Existing theory and methods generally applicable to most of the problem. Incumbent develops complete and adequate research design, adapting from available, maybe complex, methods and techniques. Limited amount of innovation or modification of procedures and techniques.

### Degree B

- Existing theory and methods applicable to some of the problem. Incumbent develops complete and adequate research design, including hypotheses, significantly modifying available, maybe complex, methods and techniques. Moderate amount of innovation or modification of procedures and techniques.

### Degree C

- Available guides limited in usefulness. High degree of originality required and applied to conduct studies. Innovation or development of new procedures and techniques. Demonstrated originality with impact on incumbent's immediate science or engineering area.

- Reviewers can use any Degree levels, A through E+ (See the Guide for full definitions of A, C, E, and E+)



# RGEG and EDGEG Part 3 Degree Definition Examples

## • Factor 4 - Contributions

### Degree A

- Independent research or full member of team. Planned and executed one or a few studies demonstrating ability to do all research steps, with some guidance. Contributing author of major paper or contribution or primary author of minor paper or contribution that fills narrow blanks in existing knowledge or theory. Serves as source of information primarily within own lab.

### Degree B

- Independent research or full member of team or lead of small team. Planned and executed multiple studies demonstrating ability to do all research steps, with little guidance. Contributing author of major paper or contribution or primary author of paper or contribution that provides significant additional knowledge or modifies theory. Serves as source of information primarily within lab or Branch. Serves on local committees or in professional groups.

### Degree C

- Could lead a team or of conceive and formulate research ideas, and/or have productive personal research. Beginning to consult for peer colleagues in field, at least one important paper or product of material significance, source of information within or his/her own organization like the Branch or Competency.

- Reviewers can use any Degree levels, A through E+

Langley Research Center (See the Guide for full definitions of A, C, E, and E+)



# EDGEG Part 1 and Part 2



# Equipment Development Grade Evaluation Guide

- “Development”
  - advances state-of-the art and is the systematic application of scientific or engineering knowledge to create new or improved equipment, systems, materials, processes, techniques or procedures for a useful function
- Approach
  - Looks at Development Engineering in five major phases:
    - Phase I – Planning and Requirements
    - Phase II – Conceptual
    - Phase III – Definition
    - Phase IV – Prototype Design
    - Phase V – Test and Evaluation



## EDGE Position Descriptions

- Covers
  - positions engaged in planning, formulating, defining, monitoring, managing and evaluating governmental and contractor work for new or improved systems or equipment
- Equipment Development Guide contains three parts
  - Part I – Product Development
  - Part II – Project Management
  - Part III – Experimental Development
- Formats in each section are different
- Use the Part that covers the greatest majority of work performed in the position



# EDGEG Part I – Product Development

- Product Development –
  - Covers the work required during the planning, conceptual and definition phases of the development process
  - Also covers providing technical direction to contractors, evaluating contractor work, guiding in-house development work, and serving as consultant or advisor on research and development programs
    - » Includes studies and analysis in depth on selected areas
    - » Systems integration of others work
- Format
  - Factor I – Assignment characteristics
  - Factor II – Level of Responsibility



## EDGEG Part I – Factors

- **Factor I – Assignment characteristics**
  - Scope and complexity of assignment
  - Applicability of precedents and/or problems in converting principles and theories into engineering technology
  - Judgment and knowledge required to solve problems and select among alternative courses of action
  - End results expected
- **Factor II – Level of Responsibility**
  - Degree of control over work and freedom in:
    - » Determining what development work to pursue
    - » Organizing the work and selecting approach
    - » Determining how assignment will be accomplished
    - » Committing the organization to a course of action



## EDGEG Part 1 Scoring

- Appropriate grade level is determined for each of the two Factors
  - Assessment based on comparison of PD/EAR with written descriptions, narrative, characteristics provided in the EDGEG, Part 1
- **Lowest** grade level of both factors determines overall grade level
  - For example, GS-13 on Factor 1 and GS-14 on Factor 2 means a **GS-13** grade level overall for that position
  - If there is a GS-14 on Factor 1 **and** a GS-14 on Factor 2, the overall grade level for that position is a **GS-14**.



## EDGEG, Part 1 General Duties

- **Factor I – Assignment characteristics**

- **GS-11**

- Performs independent analysis, investigation and delineation of specific engineering criteria, characteristics and features to meet a variety of operational, environmental and practical conditions. Usually assigned an independent portion of a larger study or project.
  - » Technical objectives are defined and can be solved by proven theory or technology.
- Monitoring of long-term development of new or improved product being accomplished by others (contractors).
- Investigation and analysis of specific data for evaluation and selection of possible design criteria to meet requirements.
- Required to plan effective approach to overcome complexities not adequately covered by standard guides and precedents.
- Require knowledge of related scientific and engineering fields to make sound technical compromises and alternative courses of action.



## EDGEG, Part 1 General Duties

- **Factor I – Assignment characteristics**
- GS-12
  - Develops solutions for nonrecurring problems in an area and investigates applications of new technology or possibility of new approaches to overcome limitations or find solutions.
    - » Precedents and guides are often lacking or conflicting.
  - Plan and carry out assignments for complete projects that have variety of factors, relationships with other specializations, and consideration of complete development cycle.
  - Identify scope of investigation, analysis, and design required by others.
  - Define specific engineering requirements and design criteria
  - Requires knowledge or performance and operating characteristics to be met for which wide range of engineering and scientific principles are applicable.



## EDGEG, Part 1 General Duties

- **Factor I – Assignment characteristics**
- GS-13
  - Serves as technical specialist in application of advanced theories, concepts, principles, and processes for an assigned area.
    - » Establish requirements and translate into principles to specify development programs
  - Plan, organize, direct, evaluate, and coordinate others
  - Conduct studies and analyses to determine feasibility of approaches, define concepts and criteria
  - Problems are of controversial or novel nature that have only basic guides available.



## EDGEG, Part 1 General Duties

- **Factor II – Level of Responsibility**
- GS-11
  - Supervisor makes assignments by giving major objectives to be attained, provides background information and pertinent data, and may suggest ways of overcoming problems.
  - Allowed considerable freedom in planning and carrying out assignments with decisions about details largely unreviewed.
  - Work with others in developing joint solution to problems based on precedents or conventional engineering applications.
  - Recommends changes to design features with Supervisor approval.
  - Supervisor reviews progress on completion of critical phases for technical adequacy, consistency with requirements, soundness of decisions, and compatibility with related parts of the project.



# EDGEG, Part 1 General Duties

- **Factor II – Level of Responsibility**

- GS-12

- Supervisor indicates general responsibilities and problems, objectives, and guidance on critical issues and policy matters.
- Independently organize work to accomplish objectives, recognize limitations of current approaches, propose and justify additional research, and recommend changes.
- Obtains opinions from technical specialists as appropriate.
- Departures from previous practice and policy are discussed with supervisor.
- Supervisor assesses completed work on basis of meeting assignment objectives.
- Conclude action on aspects that require interpretation and translation of engineering requirements into design features
- Coordinates various phases of work being accomplished by others.



## EDGEG, Part 1 General Duties

- **Factor II – Level of Responsibility**
- GS-13
  - Assignments have general objectives with broad policy and planning from higher levels
  - Technical problems resolved without reference to supervisors
  - Recommendations accepted as specialist and largely unreviewed.
  - Represent organization at conferences, high level meetings, technical committees.
  - Negotiate compromises in basic design requirements and characteristics



## EDGEG Part II – Project Management Engineering

- Covered positions report to a Project Manager
  - Managing development of equipment or systems for such projects for a Project Manager
  - Covers those who manage the combined efforts of contractors and Government agencies in support of development of equipment for a project
  - Includes duties such as preparing cost estimates, preparing schedules, participating in design reviews, and reviewing and assessing work efforts of contractors.
- Qualifications
  - Professional competence in engineering field
  - Understands
    - » Engineering and scientific principles and theories
    - » Methods, practices, and techniques of development design
    - » Criteria and characteristics underlying use and purpose of engineered items
- Format - Four Factors
  - 1. Scope of the Assignment, 2. Technical Complexity of the Assignment, 3. Responsibility and Authority, 4. Technical and Managerial Demands



## EDGEG Part II – Factors

- **Factor I – Scope of the Assignment**

- Level of difficulty and responsibility
  - » Defining technical requirements and characteristics
  - » Planning and coordinating facets of assignment to achieve product within budget

- **Factor II – Technical Complexity of the Assignment**

- Degree of complexity introduced by the technical environment and requirements of the products which affects judgment and knowledge needed to:
  - » Formulate approaches
  - » Guide, direct, and evaluate work of others
  - » Solve problems
  - » Select among alternative courses of action
  - » Achieve compromises
  - » Control schedules and costs



## EDGEG Part II – Factors (continued)

- **Factor III – Responsibility and Authority**

- Degree of freedom and extent of accountability engineer has
- Considering
  - » Criticality of the assignment to the overall project or mission
  - » Interrelationships among assignments
  - » Sharing of responsibility with other participating organizations
  - » Authority and responsibility vested in review boards and panels
  - » Legal aspects and restrictions
  - » Reliance placed on the engineer due to professional stature
  - » Terms of contracts
  - » Layering of review and control in the Project Management Office



## EDGEG Part II – Factors (cont'd)

- **Factor IV – Technical and Managerial Demands**

- Degree of technical and managerial knowledge and abilities and leadership qualities required
- Considers a number of elements that affect technical and managerial demands, including:
  - » Leadership to the agency, participating organizations, contractors and others in creating and proving feasibility of concepts, in defining requirements, and in directing
  - » Impact of the project on public, industry and Government and interest in accomplishment
  - » Conflicting pressures and requirements
  - » Participation with international and other governmental entities



## EDGE G Part 2 Scoring

Factor	A	B	C	D	E
I	2	4	6	8	10
II	2	4	6	8	10
III	2	4	6	8	10
IV	2	4	6	8	10
Maximum points	8	16	24	32	40

Grade	Total Points
GS-12	8 - 12
GS-13	16 - 22
GS-14	26 - 32
GS-15	$\geq 36$



# EDGE Part 2 Degree Definition Examples

## • Factor 1 - Scope of Assignment

### Degree C

- Wide range of independent activities or areas. Manage major elements for a specific function, or various development phases for several areas

### Degree D

- Exceeds Degree C, but does not fully meet the intent of Degree E.
- For example, manage a combination of major elements or elements of multiple functions

### Degree E

- Manage overall development effort (Chief engineer or subsystems engineer) of a complex specific end product. (Don't go by title, go by function)

OR

- Responsible for major subject-matter entities of extensive scope and variety, such as all electrical systems for a variety of aircraft.

- Reviewers can use any Degree levels, A through E+  
(See the Guide for full definitions of A, C, E, and E+)



# EDGE Part 2 Degree Definition Examples

## • Factor 2 - Technical Complexity

### Degree C

- Application of engineering and scientific principles for which no closely related precedents exist, within available or near available technology

### Degree D

- Exceeds Degree C, but does not fully meet the intent of Degree E.
- For example, application of engineering and scientific principles for which few precedents exist, beyond available technology

### Degree E

- Previous applications confined to lab studies. Unproven feasibility. Pioneering effort or significant technological breakthroughs and advances sought. Wide application for future programs/projects.

- Reviewers can use any Degree levels, A through E+ (See the Guide for full definitions of A, C, E, and E+)



## EDGEG Part 2 Degree Definition Examples

### • Factor 3 - Responsibility and Authority

#### Degree C

- Delegated responsibility and authority for day-to-day activities and decisions within assignment. Provides continuity of management throughout all development phases

#### Degree D

- Exceeds Degree C, but does not fully meet the intent of Degree E.
- For example, local authority and authoritative source for decisions about a significant portion of the project.

#### Degree E

- Full reliance as recognized management authority in overall program/project definition, organization, direction and emphasis throughout development cycle, broad authority, authoritative source for decisions about total project.

- Reviewers can use any Degree levels, A through E+ (See the Guide for full definitions of A, C, E, and E+)



## EDGE Part 2 Degree Definition Examples

### • Factor 4 - Technical and Managerial Demands

#### Degree C

- Demands stem from unusual difficulties resulting in substantial element of uncertainty and risk. Direct leadership required to implement complex innovations and resolve critical difficulties. Competent technical judgment and managerial skill recognized by other technical specialists.

#### Degree D

- Exceeds Degree C, but does not fully meet the intent of Degree E.
- For example, very difficult factors result in risk of success for state-of-art advancements. Resourceful and very good technical and leadership skills recognized by others beyond area of specialty.

#### Degree E

- Successful outcome jeopardized by variety of exceptionally difficult and complex factors. Creative leadership and outstanding managerial competence, recognized broadly. Direct authoritative participation to establish feasibility of concepts and means to achieve advancements beyond state of the art.

Reviewers can use any Degree levels, A through E+  
(See the Guide for full definitions of A, C, E, and E+)

