



CASIS Business and Economic Proposal Review Instructions

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1. Purpose

This document is intended to guide proposal evaluators in assessing International Space Station (ISS) U.S. National Laboratory flight proposals submitted to the Center for the Advancement of Science in Space (CASIS). As the manager of the ISS National Lab, CASIS is responsible for selecting research and development (R&D); technology development; and science, technology, engineering, and mathematics (STEM) engagement proposals for flight implementation. Individual evaluators are part of an overall process described in this document and provide inputs that form the basis for selection. Using this document, evaluators should be able to complete an individual proposal evaluation and specific panel evaluations for relevant proposals.

2. Overview of the Evaluation Process

Objectives of the Evaluation Process

The objective of the proposal evaluation process is to assist the CASIS final determination committee and executive director in determining which of the many proposals received best demonstrate an appropriate and effective utilization of the ISS National Lab, a publicly funded asset with unique capabilities and limited capacity. To aid in determination for the many and diverse types of proposals received, instructions are provided to each proposing entity to assist in their development of a proposal that clearly states the experimental design, execution plan, and support requirements.

Proposals are evaluated along four “lines of business,” key programmatic focus areas of the ISS National Lab: 1) in-space production, 2) technology demonstration/commercial utilization, 3) fundamental science, and 4) STEM engagement and educational outreach (see the Lines of Business section for additional description). For each line of business, the criteria in each category are weighted based on the expected strength of that criteria for that particular line of business. Weighting is applied based on expected proposal content and detail, depending on the line of business.

Each evaluator reviews and scores the proposal based on the scoring rubric for each criterion within that category. In addition, evaluators are asked to provide the overall strengths and weaknesses of the proposal to substantiate the rubric score. Finally, evaluators are asked to identify “notable features” that will help the CASIS final determination committee and executive director identify high-risk, high-reward proposals that may not have scored well but have high potential. Each evaluator documents their scoring, along with their justification and any notable features, on an Excel worksheet (the Evaluator’s Workbook) provided with these instructions.

- The scoring for each evaluation category helps establish the basis for an adjectival rating for the category on a scale from “poor” to “excellent” (see section 3, Figure 4, Score-Based Adjectival Rating Guide, for additional description).
- If there is a wide discrepancy in the scoring for a category, the panel of evaluators assigned to that category will be asked to participate in a CASIS-facilitated virtual panel meeting to determine a consensus evaluation for the category.
- Once a consensus adjectival rating is established for each category, a panel integration team is formed to determine an overall adjectival rating for the proposal across all applicable categories.
- These adjectival ratings are used by the CASIS final determination committee and executive director to determine which proposals will be selected for award.

In addition to your business and economic review, proposals are evaluated for scientific and technical merit, operational and implementation feasibility and contractual compliance. Proposals with an expressed commercial purpose will be evaluated for economic merit. The results of all evaluations are used to determine a final aggregate score and adjectival rating for a proposal.

Note: *Decision-making is a creative and dynamic way of reaching agreement in a group. Instead of simply voting for an item and having the majority decide, a consensus group is committed to finding solutions that everyone actively supports or, at a minimum, finds acceptable.*

Lines of business

The proposal instructions, evaluation categories, and criteria weighting for a proposal differ by business line. The applicable business line for a proposal is determined by the submitting organization based on the following definitions:

In-Space Production Applications: LEO-based applied R&D microgravity applications seeking to demonstrate space-based manufacturing and production activities that enable new business growth and capital investment, represent scalable and sustainable market opportunities, and produce reoccurring value with the potential to generate demand for and revenue from access to space.

Commercial Utilization: Applied R&D, technology demonstration, and Technology Readiness Level maturation to improve products and/or processes that will produce positive economic impact. All projects with an expressed commercial purpose or intent are included. Most of these will be sourced and/or serviced by Implementation Partners.

Fundamental Science: Peer-reviewed science that will lead to new discovery and knowledge, or advance our current understanding or knowledge, in various scientific disciplines through the use of microgravity, the extreme environments of space, or the unique vantage point of the ISS. Economic output from project results is not required.

STEM Engagement and Educational Outreach: Programs, projects, and public-private partnerships that leverage the ISS and space-based research to advance U.S. leadership in space-based R&D and industry-related workforce development. These programs, projects, and partnerships will engage K-12 students and enhance higher education to promote diversity and outreach into underrepresented demographics

Evaluation Categories

There are five evaluation categories, and each line of business is evaluated across either three or four categories. Some categories do not apply to some lines of business, and the criteria within each category are weighted differently depending on the line of business.

Your role as an evaluator will be focused on evaluating the proposal's Business and Economic Merit, which is described below.

Business and Economic Merit: Evaluates the market potential and application leverage of the potential solution, including market scalability and leveragability, market disruption, incremental revenue, financial commitments, and whether the project has a feasible commercialization plan and

customer engagement. This category is used for the evaluation of proposals in the following lines of business: in-space production and commercial utilization.

3. Scoring Explanation

Using the provided Evaluator’s Workbook (Excel file), evaluators should begin their evaluation on the “Proposal Summary” workbook tab, as shown in Figure 1 below. Evaluators should start by filling in the appropriate proposal name as well as their name and organization as the evaluator. To select the line of business for the proposal, evaluators should click on the arrow to the right of the blank cell and choose the appropriate line of business from the drop-down menu.

Proposal Evaluation		
Proposal		
Organization		
Evaluator		
Line of Business		Fundamental Science
Science & Technology	0.00	POOR
Implementation Feasibility	0.00	POOR
Operations & ISS Utilization	0.00	POOR
Business & Economic	0.00	NOT RELEVANT
STEM Engagement & Outreach	0.00	NOT RELEVANT
WEIGHTED TOTAL	0.00	POOR

Figure 1: Proposal Summary

For each proposal, evaluators should review for their assigned evaluation category in accordance with the criteria identified in section 4, Descriptions of the Evaluation Criteria for Business and Economic Merit. The Evaluator’s Workbook includes rubric tabs for each evaluation category to assist in the scoring along a scale from zero (noncompliant) to five (exceptional). A score of zero is indicative of a noncompliant response to the evaluation criteria and may, of itself, cause a proposal to be rejected, so evaluators are asked to use this score sparingly.

As shown in Figure 2 below, the rubric provides the criteria in column “A.” Column “B” cross references the criteria identifier from section 4 of this document, which provides descriptions of the criteria by category. Evaluators should enter their scores in column “I.”

The “Total Score” in cell J2 of each sheet is calculated based on a line of business–specific weighting schema. So, for any given set of criteria scores, the “Total Score” may be calculated differently for proposals in different lines of business. The weighting schema for each line of business is available for review in the “Weights” workbook tab.

ISS National Lab Business & Innovation		Economic Impact Panel - Proposal Evaluation Rubric					Reviewer		TOTAL SCORE				
Proposal Organization	Criteria	Proposal TYPE					Score	Weighted score	Strength/Justification	Weakness/Justification	Notable Features (Intangible)		
		Non-Compliant (d0)	Poor (s1)	Fair (s2)	Good (s3)	Very Good (s4)						Excellent (s5)	
Project outcomes can be deployed to serve sizable addressable markets (scalability)	D-1	No discussion of planned market impact is provided	Undefined address of markets, or are highly uncertain or negligible	Addressable markets for the proposed solution are identified, but with little substantiation of market potential	Addressable markets for the proposed solution are identified, with discussion of factors for market scalability	Addressable market for the proposed solution/ product provides some documented market potential (TAM of \$100 million or higher)	Addressable market for the proposed solution/ product provides documented significant market potential (TAM of \$1 billion or higher)						
Project outcomes are leverageable across other applications, customers or needs	D-2	No discussion of planned market impact is provided	Outcomes are focused on a single application, need, or customer with no ability to leverage	Outcomes have some potential to address more than one applications, needs, customers, and markets	Outcomes may be leveraged to address multiple markets, multiple applications or customers	Outcomes may address two or more multiple applications, needs, customers, and/or markets	is designed so that outcomes may address multiple applications, needs, customers, and markets						
Project results in Technology/products/solution on innovation and/or market disruption	D-3	No discussion of planned market impact is provided	No evidence provided that target markets are in any way impacted, or that material new market opportunities are created	Some evidence that the project results will be seen as innovative and attractive to markets	The project represents a unique innovation that may disrupt markets. Potential market share is unclear	The project represents a unique innovation that will be likely to disrupt markets. Products will have documented potential for competitive advantage to win at least a single digit percent market share.	The project represents a unique innovation that will be likely to disrupt markets. Products will have significant competitive advantage and have high potential to win significant (10% or more market share)						
Project leads to incremental revenue after completion	D-4	No information on revenue expectations	Revenue expectations are stated but unsubstantiated or unlikely to be achieved at material scale.	Project revenue expectations stated but not substantiated, but it is reasonable to expect some revenue.	Project revenue expectations are well substantiated and are expected and likely to be material, however the potential outcomes could vary broadly and/or results will require 10 years or more to be realized	Project revenue expectations are well substantiated. Project is expected and likely to result in incremental revenues of \$20M or more per year, achieved within 7 years	Project revenue expectations are well substantiated. Project is expected and likely to result in incremental revenues of \$50M or more per year, achieved within 5 years						
Sufficient internal / partner resource commitment is available	D-5	No information provided on resource commitments	50% or less of the full project costs are funded. No evidence of internal or partner capability to commercialize	75% or less of the full project costs are funded. There is some discussion of how access to necessary commercialization resources may be achieved	Project funding is fully established and documented by commitment letter(s). There is some discussion of how commercialization resources may be achieved	Project funding is fully available and documented by commitment letter(s). Funding needs to complete commercialization is discussed in a credible way but may not be fully quantified and addressed.	Project funding is fully available and documented by commitment letter(s). Funding to complete and commercialize the results with significant additional, quantifiable, and identified capital sources						
Project has feasible commercialization and customer engagement	D-6	No commercialization capability is provided	Low probability that project results will be advanced or deployed. There is no evidence of customer interest or engagement	Some probability that project results will be advanced or deployed, as documented by customer interest or engagement	Proposal provides some understanding of customer capabilities, with a defined commercialization market, leading to a moderate probability of further advancement or deployment	Proposal provides strong understanding of customer capabilities, with a defined commercialization strategy as documented in reported business plan items	Proposal provides strong understanding of customer capabilities, with a well defined commercialization strategy. Sufficient financial/operational plan details are provided in concert with a well-defined business plan						

Criteria to be assessed

Enter Scores

Figure 2: Rubric Scoring

Scores **must** be substantiated by one or more strengths and/or weaknesses. Strengths should be entered in column “K,” and weaknesses in column “L” (see Figure 3 below). A well-written strength will reference the criteria standard (see section 4, Descriptions of the Evaluation Criteria for Business and Economic Merit), citing the proposal page number that exceeds the standard. A well-written weakness will either state that the proposal fails to address the criteria or state how the proposal (cite page numbers) falls short of the standard. It is possible for both strengths and weaknesses to be documented for any given criterion. A score of 1 (poor) or 2 (fair) should have one or more substantiating weakness statements that are more significant than any strength statements. A score of 4 (very good) or 5 (excellent) should have one or more substantiating strength statements that are more significant than any weakness statements. A score of 3 (good) should have strength and weakness statements that essentially balance.

Strength and Weakness Statements

ISS National Lab Business & Economic Impact Panel - Proposal Evaluation Rubric										TOTAL SCORE		
Proposal Organization		Reviewer: 0								Commercial Utilization		
		Non-Compliant (-4)	Poor (-3)	Fair (-2)	Good (-1)	Very Good (0)	Excellent (1)	Score	Weighted score	Strength/Justification	Weakness/Justification	Notable Features (Intangible)
Project outcomes can be deployed to serve sizable addressable markets (scalability)	D-1	No discussion of planned market impact is provided	Undefined address of markets, or are highly uncertain or negligible	Addressable markets for the proposed solution are identified, but with little substantiation of market potential	Addressable markets for the proposed solution are identified, with discussion of factors for market scalability	Addressable market for the proposed solution/product provides some documented market potential (TAM of \$100 million or higher)	Addressable market for the proposed solution/product provides documented significant market potential (TAM of \$1 billion or higher)		0.00			
Project outcomes are leverageable across other applications, customers or needs	D-2	No discussion of planned market impact is provided	Outcomes are focused on a single application, need, or customer with no ability to leverage	Outcomes have some potential to address more than one applications, needs, customers, and markets	Outcomes may be leveraged to <u>other</u> multiple markets, multiple applications or customers	Outcomes may address two or more multiple applications, needs, customers, and markets	The technology maturation is designed so that outcomes may address multiple applications, needs, customers, and markets		0.00			
Project results in Technology/products/solution on innovation and/or market disruption	D-3	No discussion of planned market impact is provided	No evidence provided that target markets are in any way impacted, or that material new market opportunities are created.	Some evidence that the project results will be seen as innovative and attractive to markets	The project represents a unique innovation that may disrupt markets. Potential market share is unclear	The project represents a unique innovation that will be likely to disrupt markets. Products will have documented potential for competitive advantage to win at least a single digit percent market share.	The project represents a unique innovation that will be likely to disrupt markets. Products will have significant competitive advantages and have high potential to win significant (10% or more market share)		0.00			
Project leads to incremental revenue after completion	D-4	No information on revenue expectations	Revenue expectations are stated but unsubstantiated or unlikely to be achieved at material scale	Project revenue expectations stated but not substantiated, but it is reasonable to expect some revenues.	Project revenue expectations are well substantiated and are expected and likely to be material, however the potential outcomes could vary broadly and/or results will require 10 years or more to be realized	Project revenue expectations are well substantiated. Project is expected and likely to result in incremental revenues of \$10M or more per year, achieved within 7 years	Project revenue expectations are well substantiated. Project is expected and likely to result in incremental revenues of \$50M or more per year, achieved within 5 years		0.00			
Sufficient internal / partner resource commitment is available	D-5	No information provided on resource commitments	50% or less of the full project costs are funded. No evidence of internal or partner capability to commercialize	75% or less of the full project costs are funded. There is some discussion of how access to necessary commercialization resources may be achieved	Project funding is fully established and documented by commitment letter(s). There is some discussion of how commercialization resources may be achieved	Project funding is fully available and documented by commitment letter(s). Funding needs to complete commercialization is discussed in a credible way but may not be fully quantified and addressed.	Project funding is fully available and documented by commitment letter(s). Funding is complete and commercialize the results with significant additional, quantifiable, and identified capital sources		0.00			
Project has feasible commercialization and customer engagement	D-6	No commercialization capability is provided	Low probability that project results will be advanced or deployed. There is no evidence of customer interest or engagement	Some probability that project results will be advanced or deployed, as documented by customer interest or engagement	Proposal provides some understanding of customer capabilities, with a defined commercialization market, leading to a moderate probability of further advancement or deployment	Proposal provides strong understanding of customer capabilities, with a defined commercialization strategy as documented in reported business plan items	Proposal provides strong understanding of customer capabilities, with a well defined commercialization strategy. Sufficient financial/operational plan details are provided in concert with a well defined business plan		0.00			

Figure 3: Strength and Weakness Statements

Please carefully capture the strength and weakness rationale, as these statements are used by the panel integration team to synthesize selection recommendations and prioritization. Strengths and weaknesses may be shared with proposers during a debrief to assist them in preparing better proposals in the future.

Additionally, evaluators should use column “M” to record any “notable features” that may help the CASIS final determination committee and executive director identify high-risk, high-reward proposals that may not have scored well in the rubric but may have high potential. These comments are for the final determination committee’s consideration and will not be shared with proposers unless specifically permitted by the CASIS final determination committee and executive director.

Based on the rubric scoring from evaluators, an adjectival rating (excellent, very good, good, fair, or poor) will be assigned for each category. Figure 4 below shows the score-based guide referenced in assigning adjectival ratings, along with the corresponding strengths and weaknesses that would be supportive of each rating.

In the case that there is a wide discrepancy in the scoring for a category, the panel of evaluators assigned to that category will be asked to participate in a CASIS-facilitated virtual panel meeting (using WebEx or other conferencing tool) to determine a consensus adjectival rating for the category. In the panel meeting, evaluators will be provided with the score-based adjectival rating guide shown in Figure 4 as a basis for their discussion. However, it is important to note that evaluators are *not* bound by the rubric scoring to formulate the consensus adjectival rating. The score-based adjectival rating guide is based on experience scoring proposals, but the panel of evaluators are not constrained to that method of rating during the panel meeting.

Score	Adjectival Rating	Strengths and Weaknesses
0-50	Poor	A nonselectable proposal. Few if any strengths and many weaknesses, some of which may include uncorrectable noncompliant criteria responses.
51-65	Fair	A marginal proposal. Weaknesses outweigh strengths (perhaps significantly). The evaluation may identify noncompliant criteria responses, but these should be correctable with additional effort by the proposer or Implementation Partner.
66-75	Good	An acceptable proposal. Weaknesses and strengths are essentially balanced. Any noncompliant criteria responses are easily correctable. A proposal rated as “Good” in all categories would be “on the cusp” for selection.
76-85	Very Good	A better-than-average proposal. Strengths outweigh weaknesses, and there are no meaningful noncompliant criteria responses. A proposal of this rating would have attractive features noted in strengths that would easily justify selection.
86-100	Excellent	A truly outstanding proposal. Few, if any, weaknesses are noted, and there are many strengths. A proposal with this rating should be compelling and a top-tier effort.

Figure 4: Score-Based Adjectival Rating Guide

4. Descriptions of the Evaluation Criteria for Business and Economic Merit

The following descriptions are provided to facilitate review of a proposal using the Evaluator’s Workbook and should be used when scoring the criteria in the rubric. These descriptions are also supplied to proposers in the Proposal Evaluator’s Instructions for ISS National Lab Flight Programs. Strengths and weaknesses should be based on the degree to which the proposal is responsive to the criteria.

Business and Economic Merit

D-1, Project outcomes can be deployed to serve sizable addressable markets (scalability)

In scoring this criterion, evaluators are asked to assess whether the total addressable market (TAM)—the overall revenue opportunity that is available to a product or service—for the proposed technology maturation solution or product provides documented significant market potential. The highest-scoring proposals should provide a TAM of \$1 billion or higher.

D-2, Project outcomes are leverageable across other applications, customers, or needs

In scoring this criterion, evaluators are asked to assess whether the project is designed so that outcomes may address multiple applications, needs, customers, and markets. Lower-scoring proposals will not be leverageable in one or more of these dimensions.

D-3, Project results in technology/products/solution innovation and/or market disruption

In scoring this criterion, evaluators are asked to assess whether the project represents a unique innovation that will likely disrupt markets. High-scoring proposals should provide evidence that products will have significant competitive advantage and have high potential to win significant (10% or more for the highest score) market share.

D-4, Project leads to incremental revenue after completion

In scoring this criterion, evaluators are asked to assess whether the project revenue expectations are well substantiated. The proposal should credibly identify expected incremental revenues and achievement timelines. The highest-scoring proposals should credibly predict incremental revenues of \$50 million or more per year, achieved within five years.

D-5, Sufficient internal/partner resource commitment is available

In scoring this criterion, evaluators are asked to assess whether funding for this project is fully available and documented in applicable commitment letter(s). Note that this criterion assess funding availability; cost realism is assessed in criterion B-4. The highest-scoring proposals will discuss the funding needed to complete and commercialize the results, citing significant additional, quantifiable, and identifiable capital sources, whether internal or partner-provided.

D-6, Project has feasible commercialization and customer engagement

In scoring this criterion, evaluators are asked to assess whether the proposal provides a strong understanding of customer capabilities with a well-defined commercialization strategy. The highest-scoring proposals will detail a sufficient financial/operational plan in concert with a well-defined business plan.