ISS Research Institute Option

October 30, 2002

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Purpose

- To facilitate the pursuit of flight research on the ISS, optimize research opportunities within current capabilities of ISS and with future enhancements for greater capabilities, and increase the long-range productivity of research and development on the ISS.

ISS Research Institute (IRI) Description

In it's end state, the Institute is envisioned as follows:

- The Institute, contracted to a non-profit organization and managed within the existing NASA infrastructure, is devoted to research, the utilization of the ISS for science, technology, and commercial purposes, and the provision of services to the user community and the public.
- The Institute facilitates the scientific and industrial communities' access to the ISS.
- The Institute plays a pivotal role in science/technology/commercial leadership, representing and advocating for the user community and serving as the ISS interface knowledgeable expert for the users.
- The Institute may develop and sustain a certain level of flight equipment and its associated ground systems in order to better understand and represent the users' needs and issues.

End-State Functional Table

	D2 + Dev. Plds	
0) Define, Develop and Implement Policy and Strategic Plans	L	
1) Management of Research Utilization		
a) Establish Research Plans	S	
b) Manage Research Programs	L(GI)	
c) Manage Integrated Research Utilization	L(Increment Schedules);S(Program Boards)	
2) Preparing and Allocating Budgets		
a) Budget Formulation, Justification	S	
b) Budget Execution	S	
3) Selecting and Prioritizing Research		
a) Managing selection process	L	S(Internationals, PI's, T, and C)
b) Selection	L(GI)	S(Internationals, PI's, T, and C)
c) Prioritizing selections	L(GI)	S(Internationals, PI's, T, and C)
4) Establishing Payload/Experiment Requirements and Feasibility		
a) Research Requirements	L	
b) Engineering Concept Development & Hardware Assessments	L	
5) Developing Cost, Schedule, and Risk Assessments		
a) Perform Cost, Schedule, Risk Management Assessments	L(GI)	S(All others)
b) Authority to Proceed	S	
6) Developing and Qualifying Flight Research Systems		
a) DDT&E	L	
b) Subrack Integration	S	L (If IRI is the PD for the facility)
c) Operations	L	
7) Maintaining and Sustaining Flight Research Systems		
a) DDT&E	L	
b) Operations	L	
8. Developing Ground Systems	L	(For Ground Systems associated with IRI dev
9) Maintaining and Sustaining Ground Systems		
a) Identify changes/upgrades to Research Flight Systems	L	(For Ground Systems associated with IRI dev
b) Maintain & Sustain Research Ground Systems	L	(For Ground Systems associated with IRI dev
10. Constructing Ground Facilities		(Proposal dependent)
11. Maintaining Ground Facilities		(Proposal dependent)

12) Certifying Safety of Research Flight and Ground Systems	A	
13) Managing Missions and Allocating Services		
a) Advocacy, Manifesting and Resource Allocations	L	S(Approving services) S(As PI/PD representat
14) Integrating User Mission – Analytical		
a) Payload Engineering Integration		
b) Payload Software Integration and Flight Production		
15. Integrating User Missions - Physical	A	
16) Integrating User Missions - Operational		
a) Payload Training		
b) Operations Integration		
17) Conducting Research & Analysis and Disseminating Results	PI	
18. Educating and Reaching Out to the Public (including industry)		
a) Management and Control	L	A(Direction and approval of strategy and products)
b) Disseminate, Communicate & Report results to ISS customers	L	
19. Recommending ISS Pre-Planned Product Improvements	L	(For payload systems input to P3I)
20. Managing Archival of Research Samples, Data, and Results	L	

Legend:

Inherently or Appropriately Governmental	
Science/Technology/Commercialization Management and Leadership	
Sustaining Payloads	
Developing Paylaods	
Independent of Functional Allocation	
Applicable to the Principal Investigator	

ISS Research Institute (IRI) Description

- Definition
- Legal Structure
- Characteristics
- Budget and Finance
- Personnel and Staffing
- Procurement
- Timeframe and Schedule
- Management Structure and Interfaces
- Performance Evaluation
- Rationale
- Other Considerations

ISS Research Institute Description

- Definition
  - An organization devoted to research, the development and transfer of technology, and the provision of service to the scientific community and the public. The organization facilitates scientific and industrial community access to the International Space Station (ISS). The organization is established under NASA Procedures and Guidelines (NPG) 5000.1, entitled “Establishing a Science And Research Institute”.

ISS Research Institute Description

- Rationale
  - It is appropriate to use an Institute when:
    - NASA seeks to achieve an enhanced collaboration with the broader research community
  - Advantages for using an Institute are:
    - The Institute can provide the intellectual leadership role and form the central focus of the science and research program conducted at the Institute for the ISS

ISS Research Institute Description

- Characteristics
  - Although managed by and as an independent entity, the Institute's NASA affiliation is one of its essential characteristics.
  - The Institute acknowledges NASA sponsorship and support.
  - Technical direction for the Institute is developed by a NASA Board of Directors comprised of representatives from the NASA user Enterprises and the Chief Scientist. The Institute contract is managed by the Office of Biological and Physical Research under the guidance of the NASA Board of Directors.
  - The Institute fosters cooperation, not competition, among the Government, academic, and industry sectors.
  - The Institute accommodates science, technology, and commercial users.
  - Institute promotes commercial utilization and manages the interfaces for commercial payloads.

ISS Research Institute Description

- Characteristics - continued
  - The Institute adheres to NASA's policy of independent peer review for all research initiatives to ensure high quality research efforts. A competitive process, similar to the NASA Research Announcement (NRA) process, is part of the scientific research selection process for grants awarded by the Institute.
  - Internal NASA scientists (e.g., principal investigators selected under peer reviewed Research Announcements) are not excluded from participating in research conducted under the auspices of the Institute, subject to any statutory or regulatory limitations.
  - The Institute facilitates the user community access to the ISS.
  - The Institute provides a capability to manage the development of payloads, on a case-by-case basis, as agreed between the Institute and NASA.
  - The Institute conducts education and outreach programs consistent with its mission.

ISS Research Institute Description

- Legal Structure
  - The Institute is operated under a contract between NASA and a domestic academic institution or a not-for-profit organization, or a consortium of such entities.
  - The contract is competitively awarded under Federal Acquisition Regulation (FAR) section 6.302-3(a)(2)(ii) to “establish or maintain an essential engineering, research, or development capability to be provided by an educational or other nonprofit institution …”
  - The work of the Institute may be performed under subcontracts by a mix of academic institutions (including Historically Black Colleges and Universities [HBCU’s] and Other Minority Institutions [OMI’s]) and/or not-for-profit and commercial firms.

ISS Research Institute Description

- Management Structure and Interfaces
  - See organization chart and flows

- Timeframe and Schedule
  - Phased Approach:
    - Pre-Award - NASA ISS Utilization consolidation and continuous improvement; competitive acquisition process to solicit proposals and award contract
    - Post-Award - Transition of ISS Utilization Management functions from NASA to the Institute based on successful meeting of transition criteria as determined by a Performance Evaluation Board

ISS Research Institute Description

- Budget and Finance
  - Not-for profit organization
  - The Institute represents a long-term Agency commitment, with a base contract period of performance of 5 years and options to extend the period for another 5 years or longer.
  - Even though NASA makes a long-term commitment, the Institute, as an independent entity, is strongly encouraged to obtain funding support from other sources, including non-governmental sources. This additional funding support shall be for purposes consistent with the Institute's overall mission.

ISS Research Institute Description

- Personnel and Staffing
  - The Institute has non-NASA management and intellectual leadership. The Institute Director is not a NASA employee.
  - Staffing may include federal and state civil servants, academia, and industry personnel.
  - Contractor employees who operate the Institute are exempt from Federal civil service regulations.
  - Use of the Intergovernmental Personnel Act to utilize civil service personnel:
    - Requires no special Congressional action
    - Maintains technical and managerial expertise and core competencies
    - Eliminates potential loss of civil service benefits and position
- Procurement
  - Institute is subject to Federal Acquisition Regulation requirements that apply to Federal contractors.

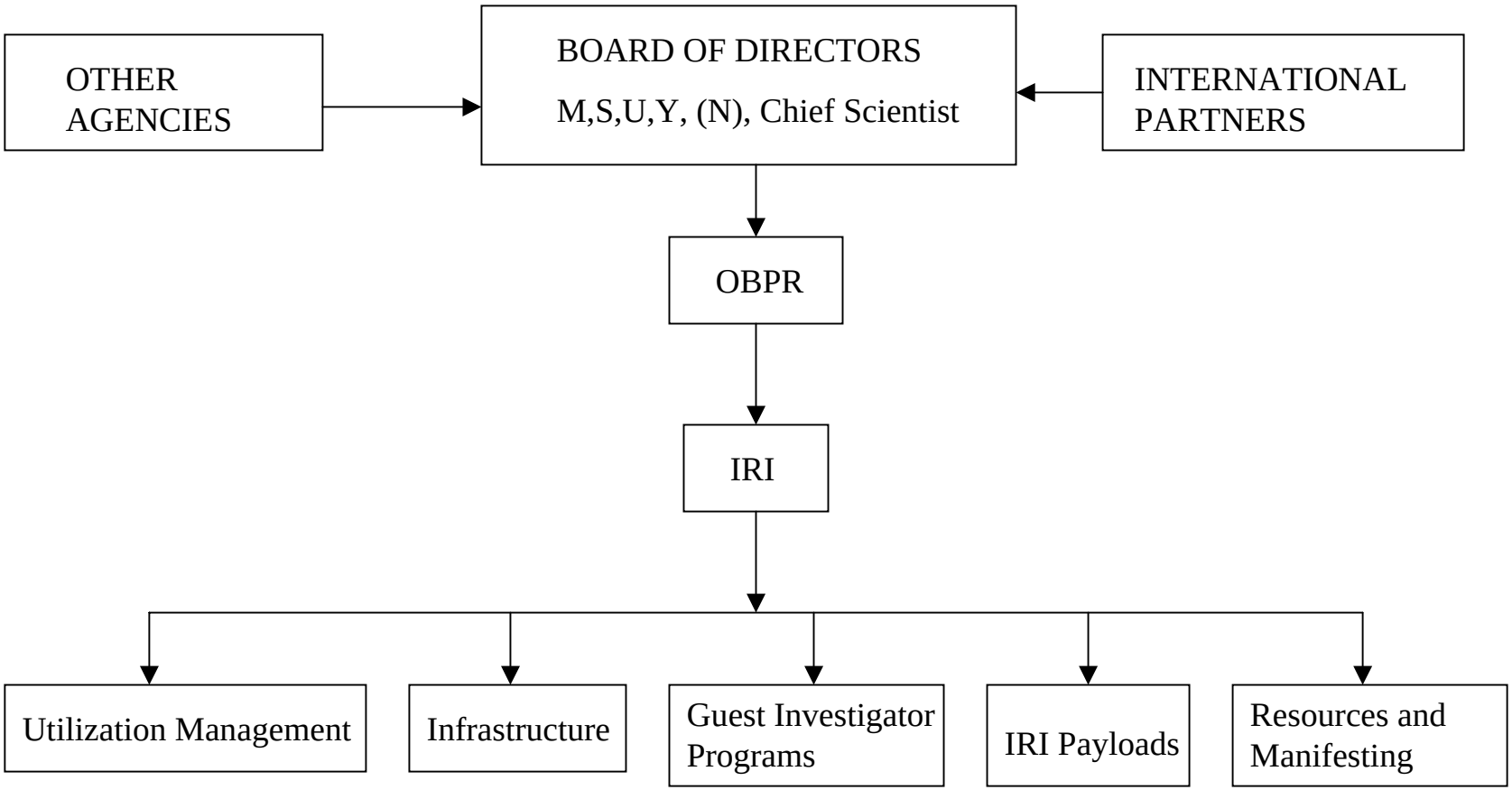
ISS Research Institute Description

- Performance Evaluation
  - Metrics are required under NPG 5000.1.
  - Phase-Based Transition Criteria:
    - Pre-Award – Submission of successful proposal for award
    - Post-Award – Institute performance of initial tasks assigned by the contract; transition of additional functions to the Institute under the contract via placement of orders and exercise of options for additional work after review by a Performance Evaluation Board

ISS Research Institute Description

- Other Considerations
  - The ISS user community is represented by multiple organizations including several NASA enterprises, other government agencies, academia, industry, and international parties. While the Institute has the capability to provide support to all users, use of the Institute for selection, payload development, results archiving and dissemination, and education and outreach will be at the discretion of these organizations.
    - The Institute will provide manifesting, resource allocations and knowledgeable expertise on the ISS interfaces for all users
  - The capability of the Institute to provide payload development is limited by payload type and complexity at a level to be determined by the NASA Board of Directors.
  - Contract provisions will limit the amount of ISS research and payload development that the Institute may perform in-house.

IRI Management Structure



IRI Functional Organization

Infrastructure

* (L) General & Administrative

2 (S) Budgets

Resources and Manifesting (L)

1c Manage Increment Schedules

13a Advocacy, Manifesting and Resource Allocations

IRI Payloads (proposed or assigned)

4a (L) Experiment Requirements & Feasibility

5 (S) Cost, Schedule, & Risk Assessments

6a,c (L) Experiment Development, Operations

6b (L) Subrack Integration (if IRI owns facility)

7 (L) Maintaining Flight Systems (IRI systems)

8 (L) Ground Systems Development (IRI systems)

9 (L) Maintaining Ground Systems (IRI systems)

Utilization Management

* (L) Focal Point for Users as Knowledgeable Experts

* (L) Promote commercial utilization & manage interfaces

1 (S) Manage Research Utilization, Boards

3 (S/L) Selection Process

18 (L) Education and Outreach

19 (S) P3I

20 (L) Managing Archive

GI Programs (L)

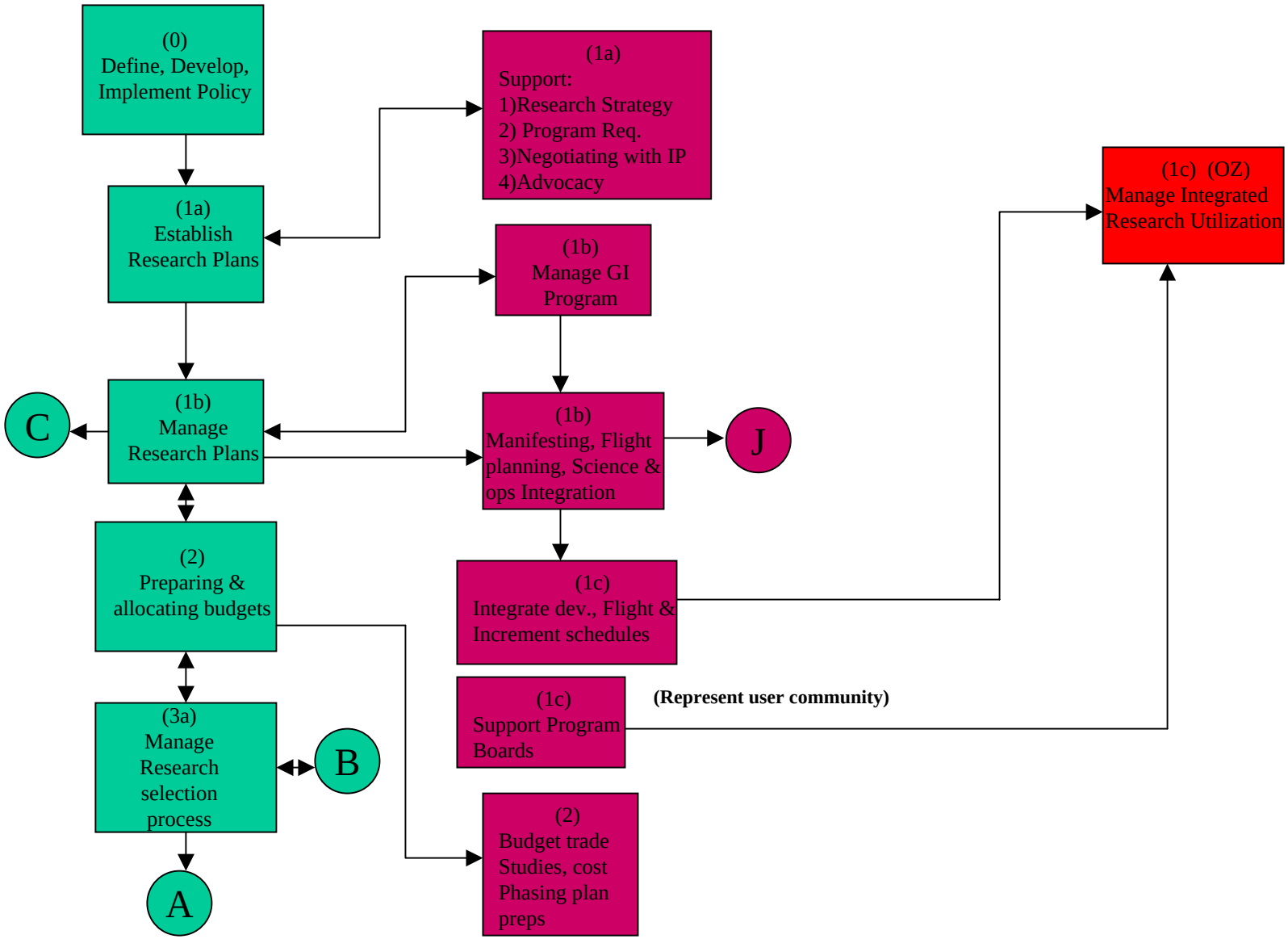
1b Manage Research Programs

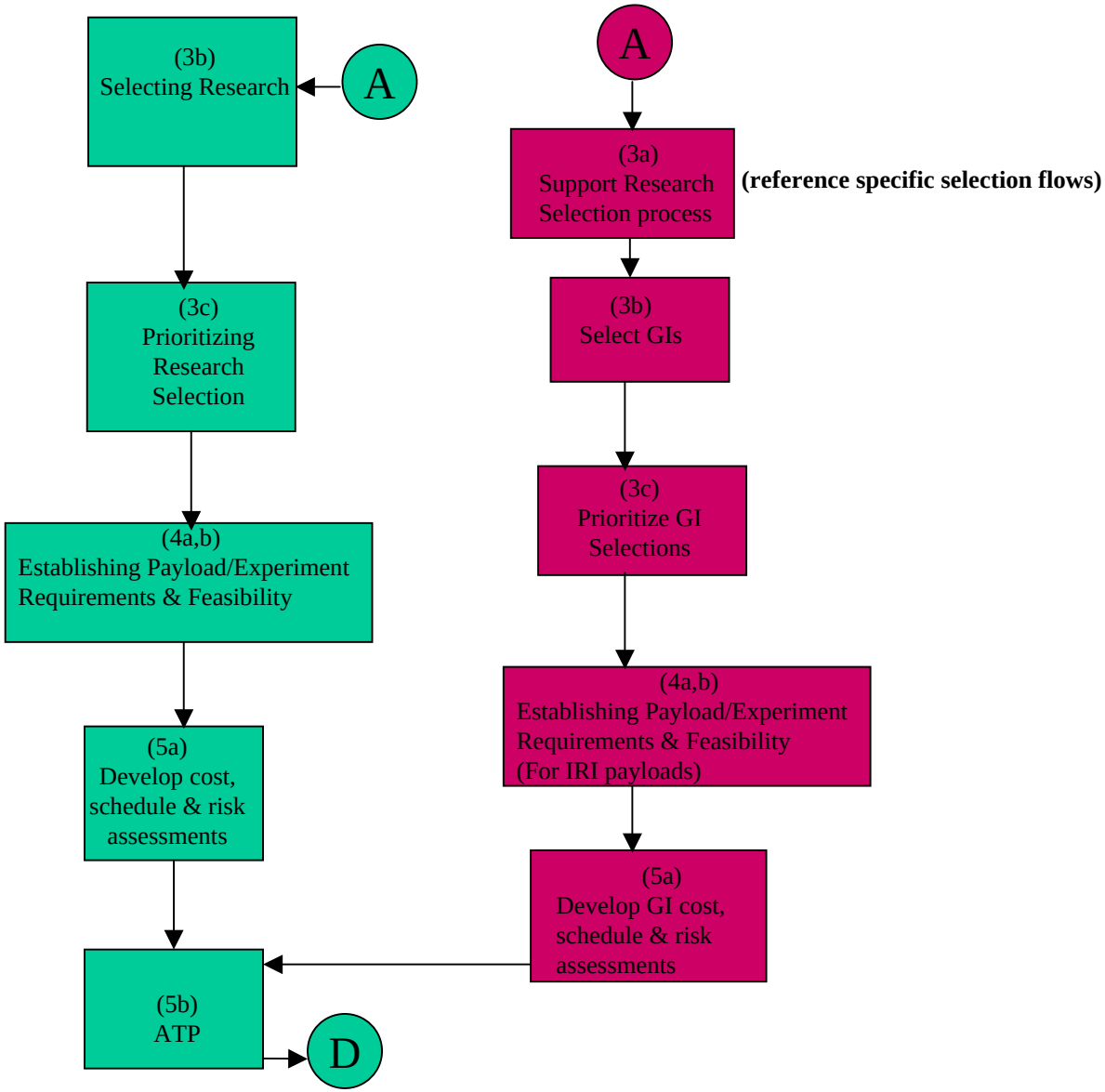
3a Manage Selection Process

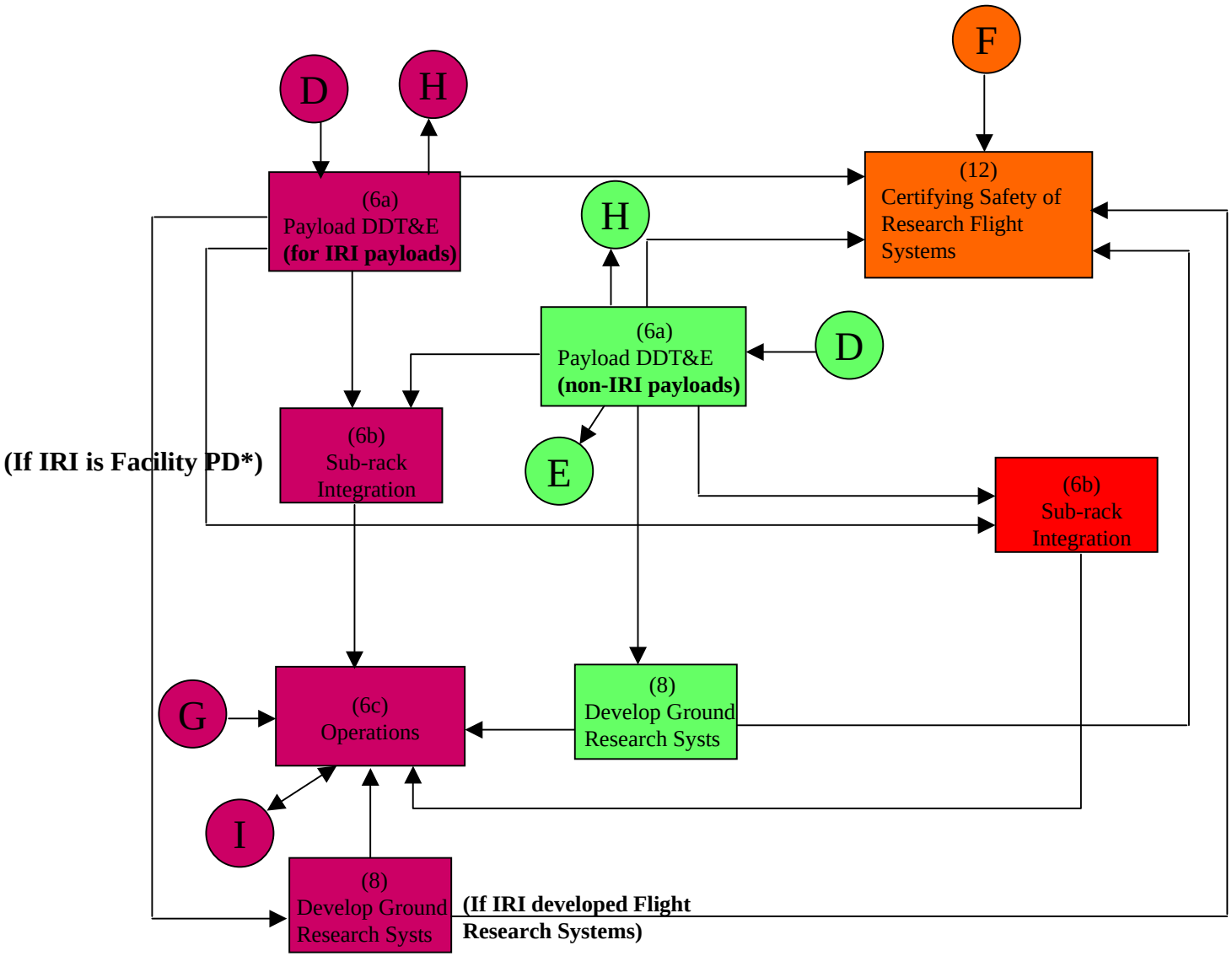
3b,c Select and Prioritize

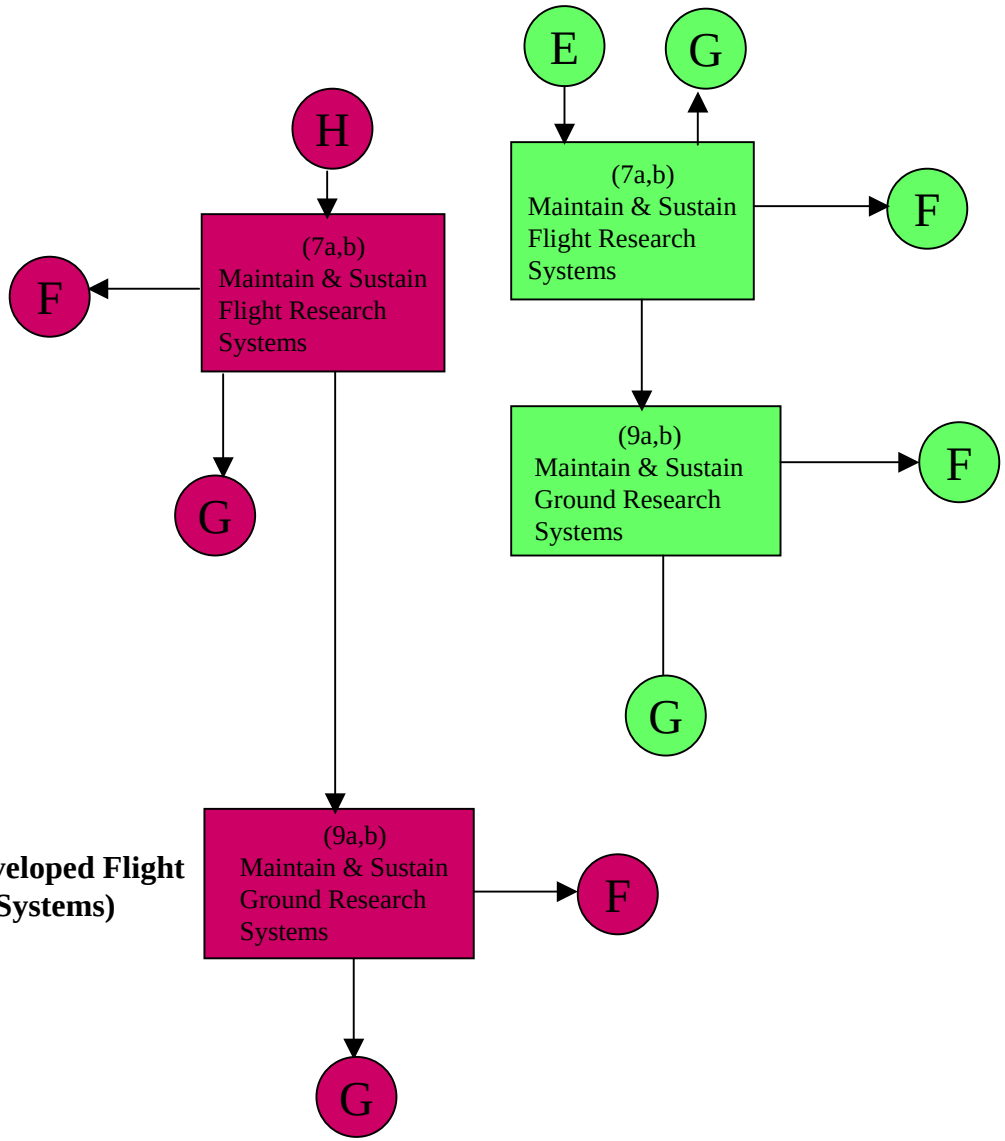
5a Cost, Schedule, & Risk Assessment

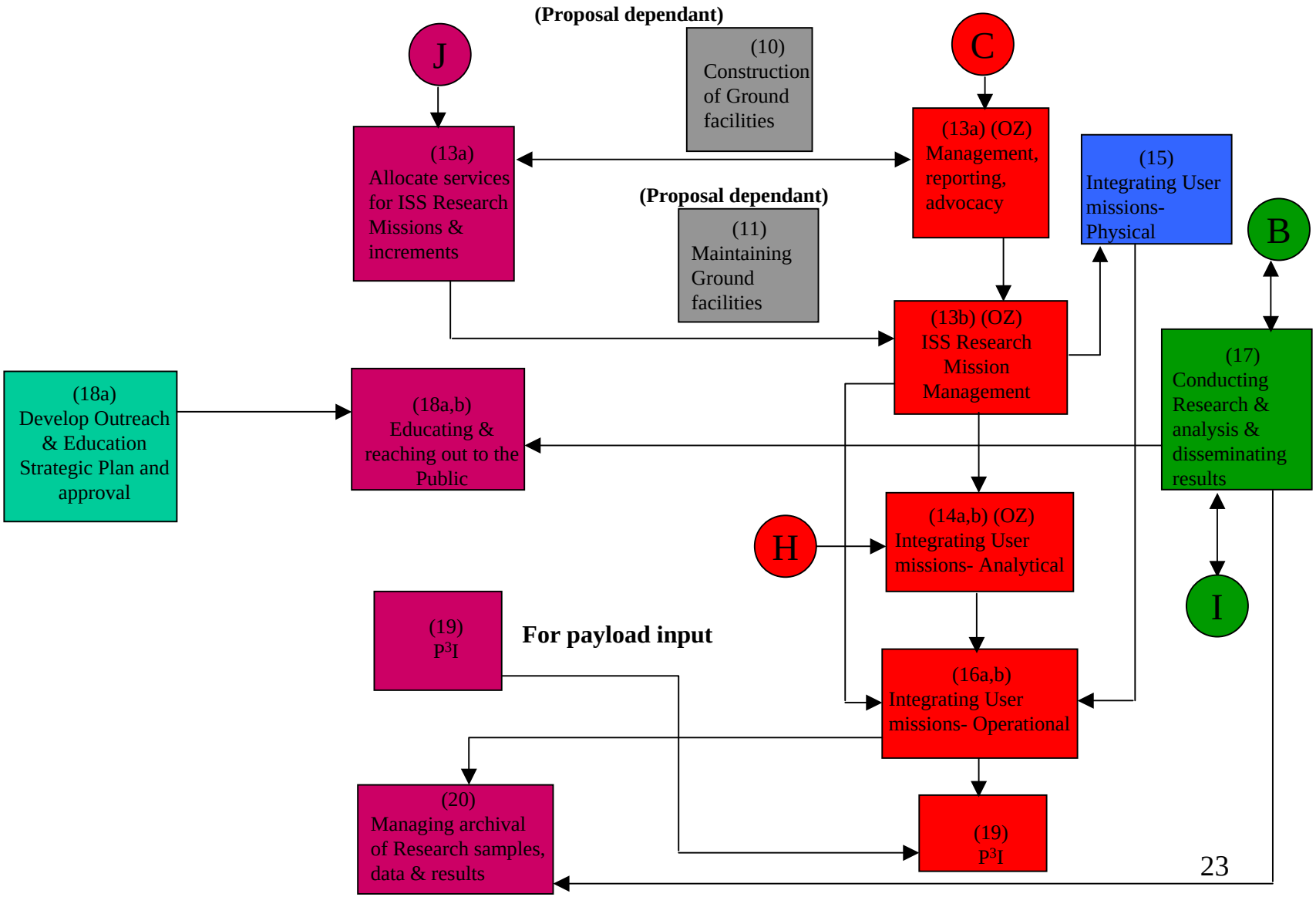
* New Institute specific function


(0)
Define, Develop, Implement Policy
(1a)
Establish Research Plans
(1a)
Support:
1)Research Strategy
2) Program Req.
3)Negotiating with IP
4)Advocacy
(1b)
Manage GI Program
(1c) (OZ)
Manage Integrated Research Utilization
C
(1b)
Manage Research Plans
(1b)
Manifesting, Flight planning, Science & ops Integration
J
(2)
Preparing & allocating budgets
(1c)
Integrate dev., Flight & Increment schedules
(1c)
Support Program Boards
(Represent user community)
(3a)
Manage Research selection process
B
(2)
Budget trade Studies, cost Phasing plan preps
A


(3b)
Selecting Research
A
(3c)
Prioritizing
Research
Selection
(4a,b)
Establishing Payload/Experiment
Requirements & Feasibility
(5a)
Develop cost,
schedule & risk
assessments
(5b)
ATP
D
A
(3a)
Support Research
Selection process
(reference specific selection flows)
(3b)
Select GIs
(3c)
Prioritize GI
Selections
(4a,b)
Establishing Payload/Experiment
Requirements & Feasibility
(For IRI payloads)
(5a)
Develop GI cost,
schedule & risk
assessments


F
D
H
(6a)
Payload DDT&E
(for IRI payloads)
(12)
Certifying Safety of
Research Flight
Systems
H
(6a)
Payload DDT&E
(non-IRI payloads)
D
(If IRI is Facility PD*)
(6b)
Sub-rack
Integration
E
(6b)
Sub-rack
Integration
G
(6c)
Operations
(8)
Develop Ground
Research Systs
I
(8)
Develop Ground
Research Systs
(If IRI developed Flight
Research Systems)

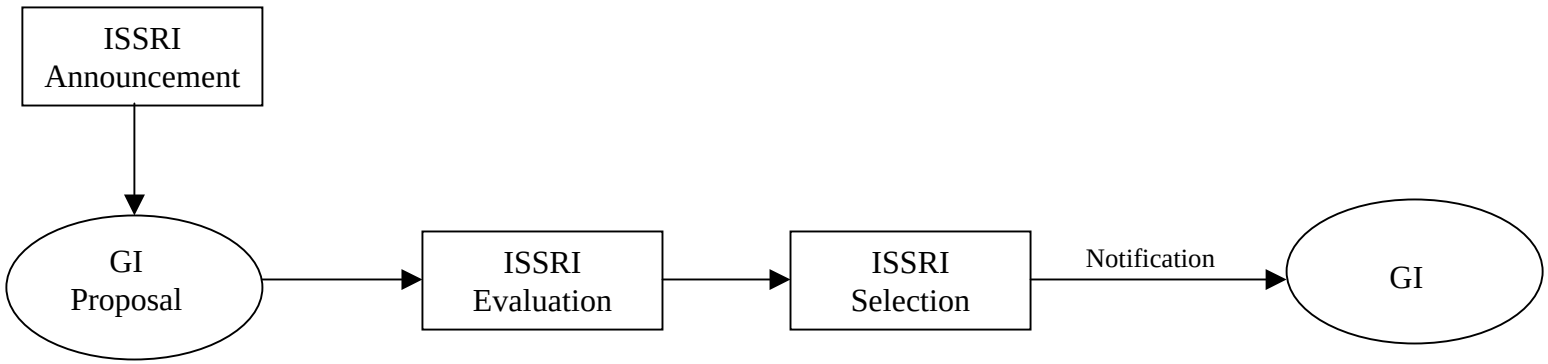

E
G
H
(7a,b)
Maintain & Sustain
Flight Research
Systems
F
F
(7a,b)
Maintain & Sustain
Flight Research
Systems
G
(9a,b)
Maintain & Sustain
Ground Research
Systems
F
G
(If IRI developed Flight
Research Systems)
(9a,b)
Maintain & Sustain
Ground Research
Systems
F
G


(Proposal dependant)
J
(10) Construction of Ground facilities
C
(13a) Allocate services for ISS Research Missions & increments
(13a) (OZ) Management, reporting, advocacy
(15) Integrating User missions- Physical
(Proposal dependant)
(11) Maintaining Ground facilities
B
(13b) (OZ) ISS Research Mission Management
(17) Conducting Research & analysis & disseminating results
(18a) Develop Outreach & Education Strategic Plan and approval
(18a,b) Educating & reaching out to the Public
H
(14a,b) (OZ) Integrating User missions- Analytical
I
(19) P3I
For payload input
(16a,b) Integrating User missions- Operational
(20) Managing archival of Research samples, data & results
(19) P3I

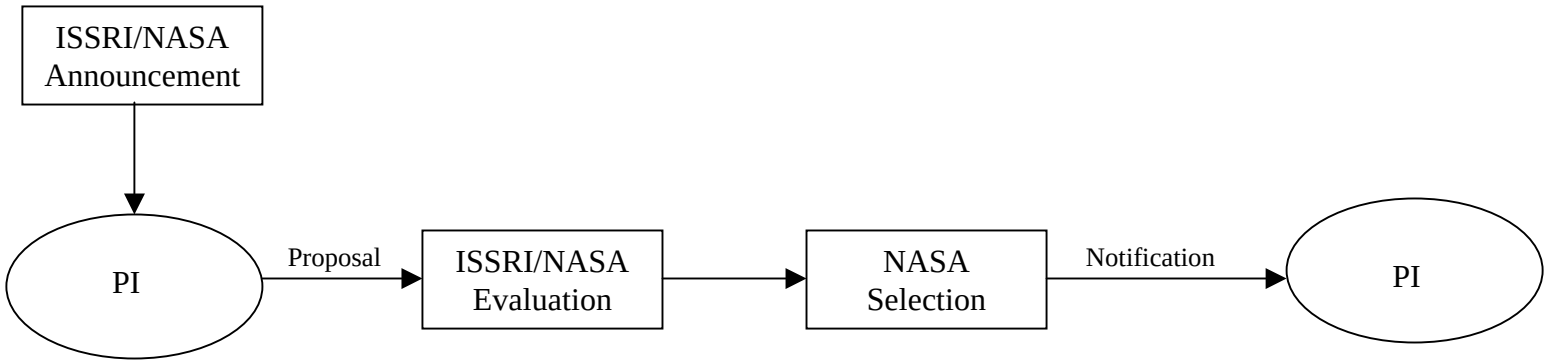
Guest Investigator Payload Example

- A Guest Investigator (GI) is defined as an Investigator who proposes to use an existing piece hardware with limited or no modifications. This would include, but not be limited to, sub-rack level multi-user “mini-facilities”.
- As such, a GI would respond to an NRA that identifies the existing hardware built for ISS Utilization.
- The IRI will accept responsibility for those existing pieces of hardware and release an IRI announcement identifying the research capabilities of these hardware units.
- The IRI will then be responsible for developing the necessary upgrades to the hardware required to meet the full set of requirements for a specific GI.
- The equivalent example would be the “mini-facilities” presently being built for several of the Research Programs such as the Multi-user Droplet Combustion Apparatus (MDCA) for the Combustion Program and the Light Microscopy Module (LMM) for the Fluid Physics program. These “mini-facilities” are being designed for multiple present and future users and will be fixtures in future NRA’s.
- In this concept the IRI will take over sustaining and maintaining responsibility for these units and be responsible for identifying future users (GI’s) for them.

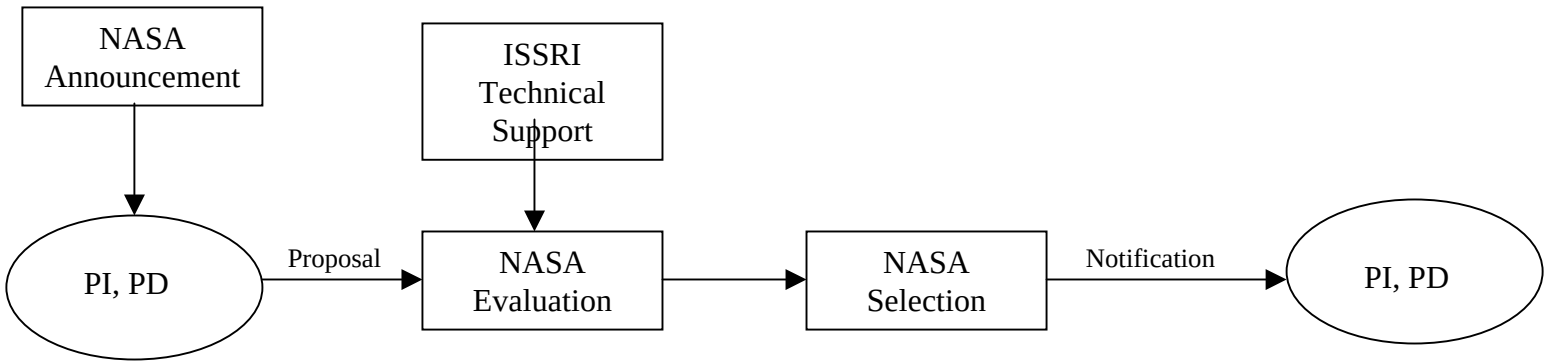
Science Selection
Guest Investigator (GI)



Science Selection
ISS Principal Investigator (PI)

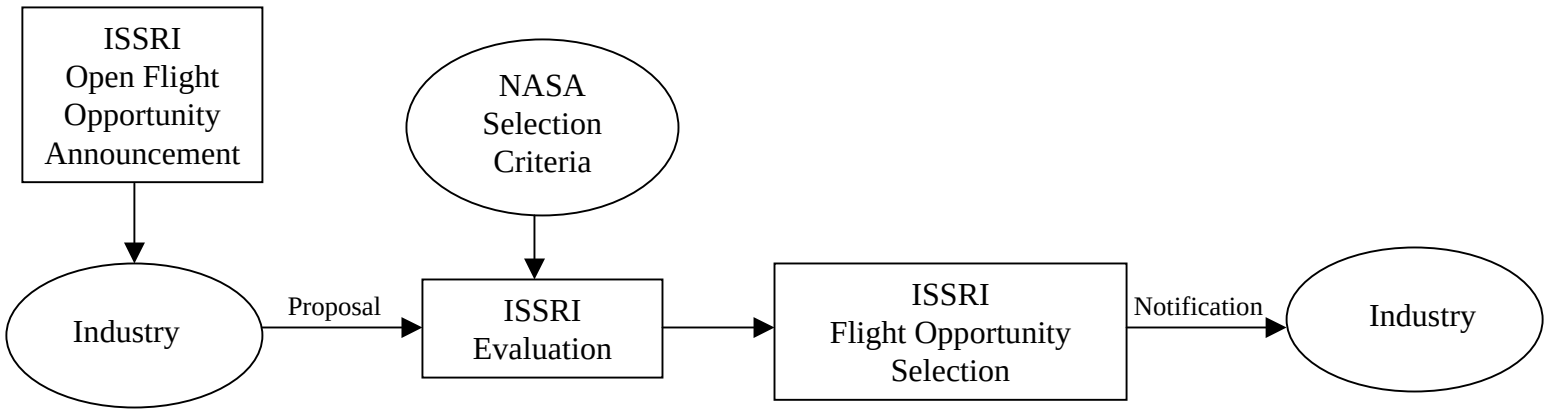


International and Non-ISS Specific Science & Technology Selection

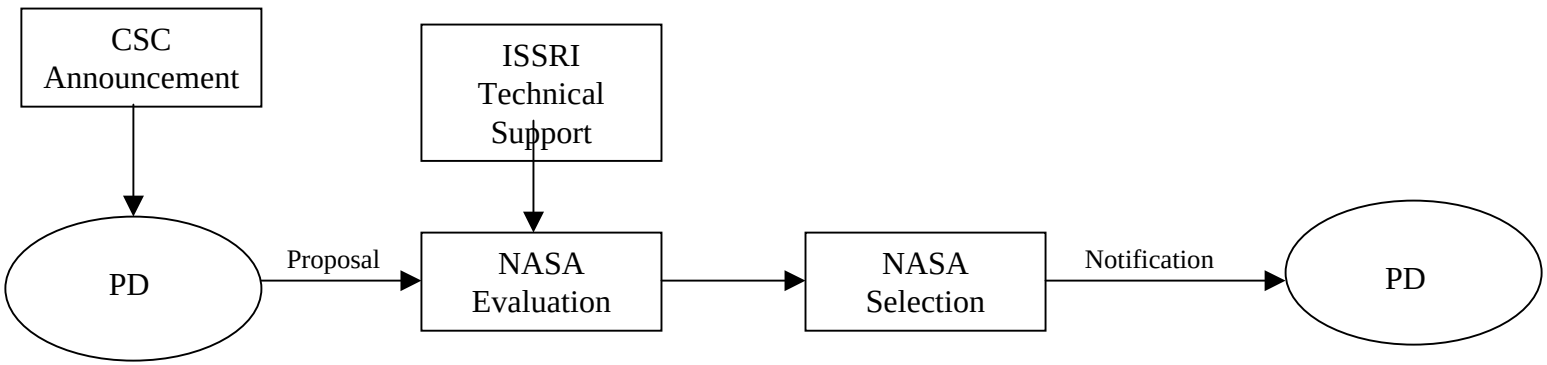


Commercial Selection

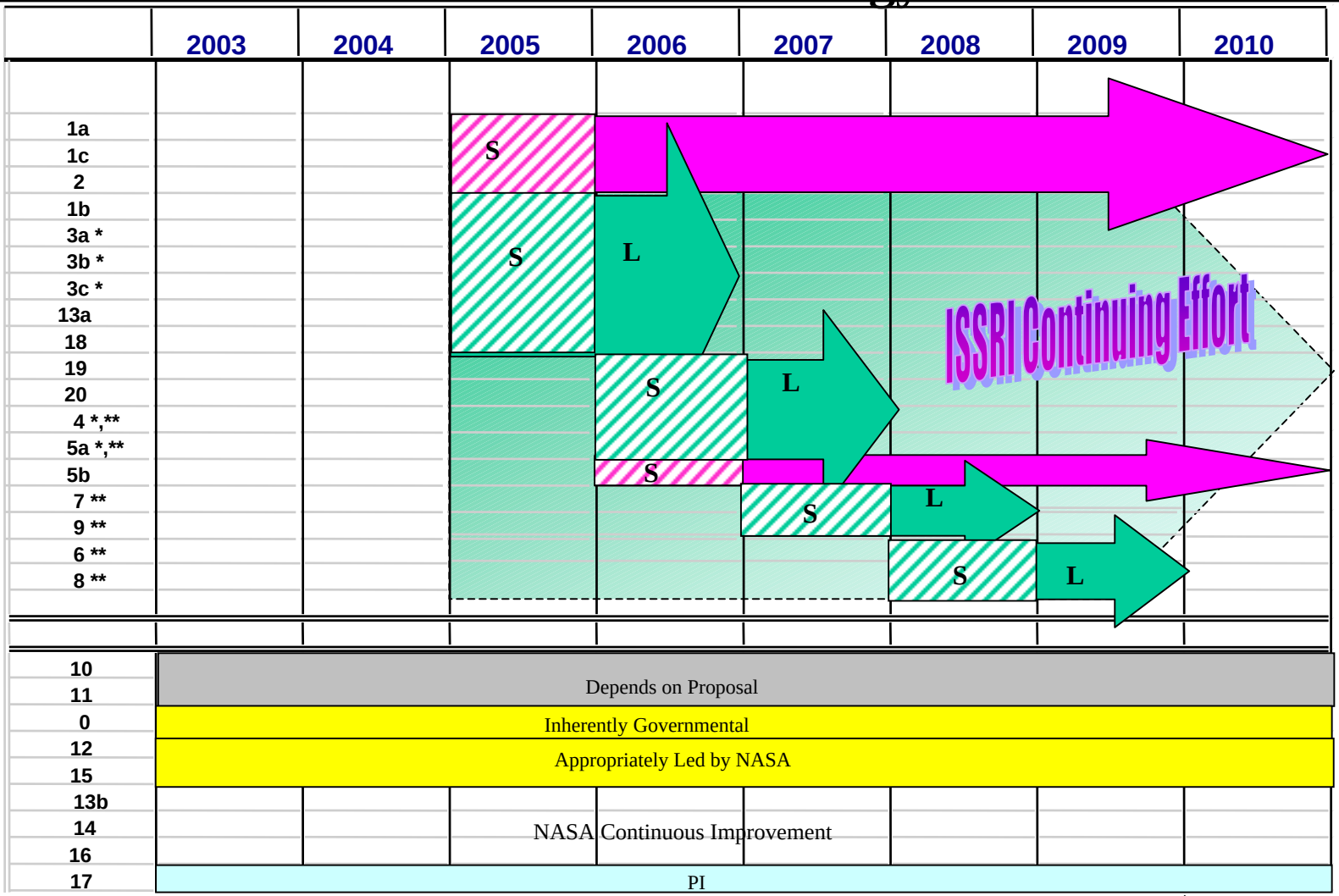
Non-subsidized Commercial



Subsidized Commercial (CSC)



ISS Research Institute (ISSRI) Option Transition Strategy



Contract Milestones

NASA Procurement — Award — Option 1

Legend:

= Start up phase **S** = Support **L** = Lead * = for GI programs ** = for designated flight systems

IRI Transition Strategy

- The transition to the ISS Research Institute (IRI) is envisioned to be a time-phased approach across five years, with the assumption that the IRI will assume the full set of responsibilities assigned by the end of the fifth year.

- The Start up phase will assign support roles to the IRI in the S/T/C leadership aspects of ISS utilization with some duties transitioning to Lead roles during the Transition phase. The Start up phase is expected to last one year.

- The Transition phase will allow the IRI to demonstrate it's ability to assume the Lead role on some of the Start up functions while assuming additional support roles on other functions. This phase assumes the IRI will demonstrate the ability to assume the full range of Lead roles required by the end of this phase. The transition phase is expected to last three years.

- The End state phase is the full up version of the IRI. It is expected that at the start of this phase the IRI has fully staffed up and demonstrated it's ability to take over the full range of roles and responsibilities required to perform it's function.

Transition Schedule

Functional Model D2	Start up	Transition			End State	
	FY05	FY06	FY07	FY08	FY09	
0) Define, Develop and Implement Policy and Strategic Plans					I	
1) Management of Research Utilization						
a) Establish Research Plans	S	S	S	S	S	
b) Manage Research Programs	S	L(GI)	L(GI)	L(GI)	L(GI)	
c) Manage Integrated Research Utilization	S	L	L	L	L	L(Increment Schedules);S(Program Boards)
2) Preparing and Allocating Budgets						
a) Budget Formulation, Justification	S	S	S	S	S	
b) Budget Execution	S	S	S	S	S	
3) Selecting and Prioritizing Research						
a) Managing selection process	S	L	L	L	L	S(Internationals, non-ISS specific)
b) Selection	S	L(GI)	L(GI)	L(GI)	L(GI)	S(Internationals, PI's, T, and C)
c) Prioritizing selections	S	L(GI)	L(GI)	L(GI)	L(GI)	S(Internationals, PI's, T, and C)
4) Establishing Payload/Experiment Requirements and Feasibility						
a) Research Requirements		S	L	L	L	
b) Engineering Concept Development & Hardware Assessments		S	L	L	L	
5) Developing Cost, Schedule, and Risk Assessments						
a) Perform Cost, Schedule, Risk Management Assessment		S	L(GI)	L(GI)	L(GI)	S(All others)
b) Authority to Proceed		S	S	S	S	
6) Developing and Qualifying Flight Research Systems						
a) DDT&E				S	L	
b) Subrack Integration				S	S	L (If IRI is the PD for the facility)
c) Operations				S	L	
7) Maintaining and Sustaining Flight Research Systems						
a) DDT&E			S	L	L	
b) Operations			S	L	L	
8. Developing Ground Systems				S	L	(For Ground Systems associated with IRI developed Flight systems)
9) Maintaining and Sustaining Ground Systems						
a) Identify changes/upgrades to Research Flight Systems			S	L	L	(For Ground Systems associated with IRI developed Flight systems)
b) Maintain & Sustain Research Ground Systems			S	L	L	(For Ground Systems associated with IRI developed Flight systems)
10. Constructing Ground Facilities						(Proposal dependent)
11. Maintaining Ground Facilities						(Proposal dependent)
12) Certifying Safety of Research Flight and Ground Systems					A	
13) Managing Missions and Allocating Services						
a) Advocacy, Manifesting and Resource Allocations	S	L	L	L	L	S(Approving services) S(As PI/PD representative)
14) Integrating User Mission – Analytical						
a) Payload Engineering Integration						
b) Payload Software Integration and Flight Production						
15. Integrating User Missions - Physical					A	
16) Integrating User Missions - Operational						
a) Payload Training						
b) Operations Integration						
17) Conducting Research & Analysis and Disseminating Results					PI	
18. Educating and Reaching Out to the Public (including industry)						
a) Management and Control	S	L	L	L	L	A(Direction and approval of strategy and products)
b) Disseminate, Communicate & Report results to ISS customers	S	L	L	L	L	
19. Recommending ISS Pre-Planned Product Improvements		S	L	L	L	(For payload systems input to P3I)
20. Managing Archival of Research Samples, Data, and Results		S	L	L	L	

Legend:

Inherently or Appropriately Governmental

Science/Technology/Commercialization Management and Leadership

Sustaining Payloads

Developing Paylaods

Independent of Functional Allocation

Applicable to the Principal Investigator

FY refers to end of Fiscal year

Contract Transition Strategy

- Contracts that may be impacted by the transfer of functions to the Institute have been identified
- It is not anticipated that any of the existing contracts will require full termination or novation
  - Several will require modification dependent on the payloads/facilities that are transferred to the Institute
  - Contracts supporting manifesting and resource allocating will also require modification
- Contract options will be written to phase out the transferred work at the appropriate times
- Bridge contracts may be required to extend support until the transfer of any given work

Facilities Strategies

- Develop/Maintain/Sustain Flight and Ground Systems
  - Functions 6, 7, 8, and 9
  - Provide access to facilities on a case-by-case basis for specific systems
- Operate Flight and Ground Systems
  - Functions 6, 7, and 9
  - Provide access to facilities on a case-by-case basis for specific systems
- Archival of Samples and Data
  - Function 20
  - Consider the extent to which archival should be performed on-site in NASA facilities (Consider existing TSC facilities)
- Administrative
  - Consider the extent to which administrative functions should be performed on-site in NASA facilities

Workforce Strategy

- One year ramp up to fully support
- One year to transition from support to lead
- 20% of OBPR payload work will transition to the IRI
- Generally, the IRI will add new workforce in order to support a function at a level 50% of the current workforce baseline
- If a total function, including leadership and implementation, transfers to the IRI, the IRI workforce equates to 100% of the current workforce baseline

Competencies Strategy

- Limit number and types of payloads Institute develops in order to strike a balance between staffing critical competencies for both the IRI and NASA
- NASA will work with the IRI to ensure that the split of work, i.e. payload development, supports NASA competency needs
  - NASA assigns payloads to IRI
  - IRI partners with proposers for development in open competitions
- NASA retains manifesting competency through manifesting of STS and ISS vehicle hardware

Contracts

CONTRACTS THAT MAY REQUIRE MODIFICATION AT IRI INCEPTION

OWNER	CONTRACTOR NAME	CONTRACT NUMBER	END DATE	CONTRACT EXTENSIONS	FUNCTIONS												
					1	2	3	4	5	6	7	8	9	13	18	19	20
LEVEL I - HQ																	
HQ/CODE U	Global Science & Technology, Inc	NASQ-00017	Feb-05				X		X								
LEVEL II - RPOs																	
JSC/SSPO	USA	NAS9-20000	Sep-02											X			
JSC/SSPO	BOEING	NAS15-10000	Dec-03													X	
JSC/SSPO	Lockheed-Martin	NAS9-19100	Dec-03											X	X		
JSC/SSPO	SAIC	NAS9-00086	Sep-02											X	X		
JSC/CODE M	SAIC	NAS9-00086	Sep-02											X	X		
JSC/Life Sci	Lockheed-Martin (SEAT)	NAS9-19100	Dec-03					X		X	X	X	X	X	X		X
JSC/Life Sci	NSBRI	NCC9-58	Sep-02				X		X			X	X		X		
MSFC/PLs Ofc	Boeing (Payload Utilization)	NAS9-50000	Sep-04						X	X	X			X		X	
MSFC/PLs Ofc	Lockheed (Utilization & Mission Service)	NAS9-44000	Sep-03						X			X	X			X	
MSFC/RPO/MRP	Computer Systems Technology (CST)	NAS8-00060	Nov-02								X				X		X
MSFC/RPO	Cherokee Nation Industries, Inc.	NAS8-01058	Jan-06		X									X			
		H33158D															
MSFC/RPO	Computer Systems Technology (CST)	NAS8-00060	Nov-02											X			
MSFC/RPO/SPD	bd Systems	NAS8-99005	Apr-03											X			
MSFC/RPO/SPD	CST	NAS8-00060	Nov-02												X		
MSFC/RPO/SPD	Boeing	NAS8-50000	Sep-04							X							
MSFC/RPO/SPD	Wisconsin Center for Robotics	NCC8-241	Oct-02			X	X	X	X	X	X	X	X		X		X
MSFC/RPO/SPD	Center for Bioserve Space Technologies - Univ of Colorado	NCC8-242	Oct-02			X	X	X	X	X	X	X	X		X		X
MSFC/RPO/SPD	Center for Biophysical Sciences and Research (UAB)	NCC8-246	Oct-02			X	X	X	X	X	X	X	X		X		X
MSFC/RPO/SPD	Solidification Design Center (Auburn Univ)	NCC8-237	Oct-02			X	X	X	X	X	X	X	X		X		X
MSFC/RPO/SPD	Consortium for Material Development in Space (UAH)	NCC8-243	Oct-02			X	X	X	X	X	X	X	X		X		X
MSFC/RPO/SPD	Center for Commercial Applications of Combustions in Space - Colorado School of Mines	NCC8-238	Oct-02			X	X	X	X	X	X	X	X		X		X
MSFC/RPO/SPD	Center for Advanced Microgravity Materials Processing - Northeastern Univerisity	NCC8-244	Oct-02			X	X	X	X	X	X	X	X		X		X
MSFC/RPO/SPD	Center for Space Power - Texas A&M	NCC8-236	Oct-02			X	X	X	X	X	X	X	X		X		X
MSFC/RPO/SPD	ProVision Technology	NCC8-221	Oct-02			X	X	X	X	X	X	X	X		X		X
MSFC/RPO/SPD	Commercial Space Center for Engineering - Texas A&M	NCC8-226	Oct-02			X	X	X	X	X	X	X	X		X		X
MSFC/RPO/SPD	Texas Center for Superconductivity and Advanced Materials - Univ of Houston (Old name: Space Vacuum Epitaxy Center)	NCC8-239	Oct-02			X	X	X	X			X	X		X		X
MSFC/RPO/SPD	Center for Commercial Development of Space Power and Advanced Electronics - Auburn Univ	NCC8-237	Oct-02			X	X	X	X			X	X		X		X
MSFC/RPO/SPD	Center for Satellite and Hybrid Communications Networks - Texas A&M	NCC8-235	Oct-02			X	X	X	X			X	X		X		X
MSFC/RPO/SPD	Space Communications Technology Center- Univ of Florida	NCC8-230	Oct-02			X	X	X	X			X	X		X		X
JSC/SPD	Medical Informatics and Applications Center (Virginia Commonwealth University)	?	?			X	X	X	X			X	X		X		X
KSC	Dynamac (Life Sciences Support)	NAS10-02001	Sep-05	4 1-Yr Ext to FY09		X		X	X	X	X	X	X				
KSC	Boeing	NAS10-11400	Jun-02	In Competition		X			X			X	X				
ARC/FUND BIO	Lockheed-Martin	NAS2-1463	Apr-02														

Contracts

LEVEL III - CENTERS																	
MSFC/MRP	Hernandez Engineering	NAS8-00179	Nov-02														
	Teledyne Brown Engineering	NAS8-00205	Nov-00					X									
	Pace & Waite	NAS8-40831	Jul-10					X		X	X						
	ASRI (outreach)	NAS8-97330	May-02											X			
	ASRI (outreach)	NAS8-99006	Mar-02											X			
	CST	NAS8-98001	May-02						X								X
	CSC	NAS8-60000	Oct-02		X				X								
	Boeing (non-MSRF)	NAS8-50000	Sep-04							X							
	AMMSA	NCC8-66	Apr-02				X	X			X	X		X			X
	Cortez	NAS8-97327	Sep-02								X						
	TecMasters	NAS8-98098	Mar-03							X	X						
	Sverdrup - New Number, Jan. 2001	NAS8-00187	Sep-02							X	X						
	Pace & Waite	NAS8-01121	Aug-02				X	X	X	X							
	TVA	H-28042D	Mar-02					X									
JSC/MRP	Wyle Laboratories	NAS9-97114	Jun-02	Ext in work to 9/02				X	X	X	X	X		X			X
GRC/MRP	ZIN Technologies	NAS3-99154	Dec-04						X	X	X						
	Northop Grumman	NAS3-99155	Apr-05						X	X	X	X					
	NCMRFC (Case Western)	NCC3-544	Aug-07				X	X			X	X		X			X
ARC/FUND BIO	Dichroma (Administrative Support Only)	NAS2-97065	Sep-02		X												
	Hernandez Engineering	A 61829D	Apr-03														
	Orbital Technologies (Hdwe Dev - BPS)	NAS2-97021	Dec-02							X							
	StarShot (Hdwe Dev - AAH)	NAS2-98024	Aug-03							X							
	Payload Systems Inc (Hdwe Dev - CCU)	NAS2-96001	Sep-04							X							
	Orbital Technologies (Hdwe Dev - PRU)	NAS2-80	Sep-07							X							
	Lockheed-Martin	NAS2-1463	Apr-02					X	X	X	X			X			X
	= IRI Support only at end state																
	= IRI overall Lead role at end state																
	All other functions include mixture of lead and support roles as related to GI program																
	As listed, no contracts will require termination in IRI option.																

ISSRI Workforce Outcome

Option Implementation Workforce Phasing

Institute

FUNCTION	FY	CS to NGO	IPA to NGO	Cont. to NGO	Additional Workforce	Infrastruct (total only)	Total NGO
0	FY03	-	-	-	-	-	-
	FY05	-	-	-	-	-	-
	FY07	-	-	-	-	-	-
1	FY03		-			-	
	FY05	0	-	0	4	-	4
	FY07	0	-	5	3	-	8
2	FY03		-			-	
	FY05	0	-	0	5	-	5
	FY07	0	-	0	5	-	5
3	FY03		-			-	
	FY05	0	-	0	6	-	6
	FY07	0	-	0	6	-	6
4	FY03		-			-	
	FY05		-			-	
	FY07	8	-	30	0	-	38
5	FY03		-			-	
	FY05		-			-	
	FY07	11	-	7	5	-	23
6	FY03		-			-	
	FY05		-			-	
	FY07	0	-	0	0	-	0
7	FY03		-			-	
	FY05		-			-	
	FY07	12	-	28	28	-	68
8	FY03		-			-	
	FY05		-			-	
	FY07	0	-	0	0	-	0
9	FY03		-			-	
	FY05		-			-	
	FY07	6	-	6	6	-	19
10	FY03	-	-	-	-	-	-
	FY05	-	-	-	-	-	-
	FY07	-	-	-	-	-	-
11	FY03	-	-	-	-	-	-
	FY05	-	-	-	-	-	-
	FY07	-	-	-	-	-	-
12	FY03	-	-	-	-	-	-
	FY05	-	-	-	-	-	-
	FY07	-	-	-	-	-	-
13	FY03		-			-	0
	FY05	7	-	13	10	-	30
	FY07	14	-	25	0	-	39
14	FY03	-	-	-	-	-	-
	FY05	-	-	-	-	-	-
	FY07	-	-	-	-	-	-
15	FY03	-	-	-	-	-	-
	FY05	-	-	-	-	-	-
	FY07	-	-	-	-	-	-
16	FY03	-	-	-	-	-	-
	FY05	-	-	-	-	-	-
	FY07	-	-	-	-	-	-
17	FY03	-	-	-	-	-	-
	FY05	-	-	-	-	-	-
	FY07	-	-	-	-	-	-
18	FY03		-			-	
	FY05	0	-	0	16	-	16
	FY07	14	-	18	0	-	32
19	FY03		-			-	
	FY05		-			-	
	FY07	2	-	5	0	-	7
20	FY03		-			-	
	FY05		-			-	
	FY07	9	-	24	0	-	33
Total	**FY03**	0	0	0	0	0	0
	FY05	7	0	13	41	12	73
	FY07	76	0	149	54	56	334

Competencies Assessment

- Loss of any identified high priority competencies at the NASA Centers through function transfer to the IRI have been mitigated by the competency strategy

ISSRI Budget Outcome

Option Implementation Budget Phasing

ISS Research Institute

FUNCTION	FY	CS to NGO ($150K each) [NO IPAs]	NGO R&D $M	Additional Workforce ($150K each)	Infrastruct (total only)	Total
0	FY03	-	-	-	-	-
	FY05	-	-	-	-	-
	FY07	-	-	-	-	-
1	FY03				-	
	FY05	0.000	0.000	0.600	-	0.600
	FY07	0.000	1.192	0.450	-	1.642
2	FY03				-	
	FY05	0.000	0.000	0.750	-	0.750
	FY07	0.000	0.000	0.750	-	0.750
3	FY03				-	
	FY05	0.000	0.054	0.900	-	0.954
	FY07	0.000	0.120	0.900	-	1.020
4	FY03				-	
	FY05				-	
	FY07	1.200	16.045	0.000	-	17.245
5	FY03				-	
	FY05				-	
	FY07	1.650	2.397	0.750	-	4.797
6	FY03				-	
	FY05				-	
	FY07	0.000	0.000	0.000	-	0.000
7	FY03				-	
	FY05				-	
	FY07	1.800	18.916	4.200	-	24.916
8	FY03				-	
	FY05				-	
	FY07	0.000	0.000	0.000	-	0.000
9	FY03				-	
	FY05				-	
	FY07	0.900	4.397	0.900	-	6.197
10	FY03	-	-	-	-	-
	FY05	-	-	-	-	-
	FY07	-	-	-	-	-
11	FY03	-	-	-	-	-
	FY05	-	-	-	-	-
	FY07	-	-	-	-	-
12	FY03	-	-	-	-	-
	FY05	-	-	-	-	-
	FY07	-	-	-	-	-
13	FY03				-	
	FY05	1.050	2.682	1.500	-	5.232
	FY07	2.100	4.340	0.000	-	6.440
14	FY03	-	-	-	-	-
	FY05	-	-	-	-	-
	FY07	-	-	-	-	-
15	FY03	-	-	-	-	-
	FY05	-	-	-	-	-
	FY07	-	-	-	-	-
16	FY03	-	-	-	-	-
	FY05	-	-	-	-	-
	FY07	-	-	-	-	-
17	FY03	-	-	-	-	-
	FY05	-	-	-	-	-
	FY07	-	-	-	-	-
18	FY03				-	
	FY05	0.000	3.644	2.400	-	6.044
	FY07	2.100	3.941	0.000	-	6.041
19	FY03				-	
	FY05				-	
	FY07	0.300	0.798	0.000	-	1.098
20	FY03				-	
	FY05				-	
	FY07	1.350	2.995	0.000	-	4.345
Total	**FY03**	**0.000**	**0.000**	**0.000**	**0.000**	0.000
	FY05	**1.050**	**6.326**	**6.150**	**1.800**	15.326
	FY07	**11.400**	**55.020**	**7.950**	**10.500**	84.870

ISSRI Budget Assessment

- The Institute is established in FY05 with a budget of approximately $18M.
  - Sufficient to establish a foundation for development of a viable Institute
- By the end of FY07 the Institute grows towards a budget of approximately $88M.
  - This forecasted business growth is sufficient to attract a range of potential bidders
- Functions and budget associated with payload and ground systems development functions would not initiate transition until post FY07 (beyond scope of available data).

Advantages/Disadvantages/Risks

	Advantages	Disadvantages	Risk	Risk Mitigation
Purpose				
Legal Structure	Well-established precedent for establishing research institutes, governed by NPG 5000.1	A non-profit organization might not be best-suited to provide engineering functions		
	Contract provides NASA with oversight control, while allowing the institute to provide independent, intellectual leadership	The institute may not assume inherently governmental functions		
	Historical NASA precedent of successful research institutes			
	Minimum 10 year contract (base with options) allows long term Agency commitment with opportunity for modifying strategic direction of institute			
	Institute structure has a finite life span governed by the contract.			
Characteristics	Maintains a clear and public NASA affiliation and acknowledges NASA sponsorship	The addition of engineering functions to a research focused Institute may dilute the primary goal of S/T/C leadership and will make the organization larger and more complex	Institute will become larger and more complex due to addition of engineering functions	Limit number and types of payloads Institute develops in order to manage engineering functions and strike a balance between staffing critical competencies for both the IRI and NASA while enabling development of Institute knowledge
	Provides an intellectual leadership role outside of NASA	Research institute must be enhanced to enable appropriate representation and management of technology and commercial utilization	Institute may not adequately represent the diverse user communties	Structure contract incentives to provide S/T/C representation. Structure RFP to seek organizations structured to work with entire user community. Board of Directors has representation from all relevant NASA Enterprises and the Chief Scientist.
	An institute with strong leadership and user representation may be perceived as more fully engaging the user community in the utilization process, leading to increased customer satisfaction and enhanced advocacy by the users	Potential for real and perceived conflicts of interest in managing the selection process	Potential for conflicts of interest for selections a) where Institute personnel propose, b) commercial proposals from Institute subcontractors	a) Institute personnel allowed up to a certain percentage of selected proposals, b) commercial proposals selected based on objective criteria c) internal Institute firewalls for evaluation and selection personnel
	Facilitates scientific and industrial community access to ISS space and ground-based assets	Institute cannot negotiate and approve agreements directly with the International Partners	Institute performance is directly affected by implementing new and current IP agreements and barters	COTR and Institute have representatives supporting the negotiation process
	Fosters cooperation, not competition, among the Government, academic, and industry sectors	STS and ISS manifesting are in the process of being combined to the benefit of both. If the IRI is responsible for ISS manifesting, the processes are divorced again.		
	Adheres to NASA's policy of independent peer review for research			

Advantages/Disadvantages/Risks

Characteristics	Internal NASA scientists not excluded from participating in research			
	Allows institute to be an optional service for independent user organizations			
	Opportunity to partner with users for payload development can enhance the Institute's payload development capability			
	Facilitates user community access to the ISS			
	Provides capability to manage development of payloads on a case-by-case basis upon institute/NASA agreement			
Budget and Finance	Institute may (and is encouraged to) obtain funding support from other sources, including non-governmental			
	Institute can provide an independent estimate on given functions, enhancing NASA management decisions			
	Represents a long-term funding commitment by NASA			
Personnel and Staffing	Management and intellectual leadership by non-NASA personnel	Potential for salary and compensation discrepencies		
	Ability to hire "best and brightest" due to reputation of intellectual leadership	Limitations on IPA arrangements 6 year limit with 4 year term arrangements		
	Ability to quickly hire			
	Institute employees exempt from Federal civil service regulations			
	May utilize civil service personnel via IPA, maintaining NASA technical and managerial expertise and core competencies			
	Direct participation of Civil Service without loss of benefits and position			
	Allows staffing by federal and state civil servants, academia, and industry personnel			

Advantages/Disadvantages/Risks

Management Structure and Interfaces	Overall management direction and guidance provided by a cross-Enterprise Board of Directors with contract management provided by OBPR	Must work within current STS and ISS board structure. Potential for duplication of boards within the Institute.		
	Provides focal point for PI interfaces	Must manage interfaces for multiple science discplines and S/T/C		
	Provides additional user advocacy to the existing ISS board structure			
Procurement	Implements a 'best value' research program for available resources	Subject to FAR requirements that apply to Federal contractors		
Timeframe and Schedule	Allows current contract consolidation and continuous improvement activities to continue	Procurement schedule for a large, complex contract is relatively long	Contractor may not be prepared to meet transition schedule	If PEB determines transition criteria not met, additional functions are not transferred to Institute
	Standard procurement activity may start immediately upon congressional notification		Contractor may not adequately perform a function	Institute initially performs a support role for all functions prior to transition of the lead role. Lead role will not transfer in transition criteria not met.
	Phased transition based on successful meeting of transition criteria mitigates transition risk			
	Transition schedule may be shortened based on contractor performance			
	Contract award post-US core complete in a more stable ISS program			
Performance Evaluation	Performance evaluated based on metrics, governed by NPG 5000.1			
	Performace Evaluation Board determines successful meeting of transition criteria in order to trasition additional functions via placement of orders and exercise of options			

Backup

IRI Option Down-Select Rationale

- For-Profit Contract
  - Strong perception of conflict of interest between profit motive and S/T/C leadership role and goals is a major weakness
  - This major weakness affects all functional variants B through H

- Non-Profit Institute End State Option D2
  - B2 provides high priority S/T/C/ leadership
  - C2 has insufficient work to support Institute interest and limits insight into payload development processes, issues, and concerns

IRI Option Down-Select Rationale

- D2 provides selected payload development capability
  - Gives IRI insight into PD processes, issues, and concerns in order to facilitate and improve interfaces and processes
  - Enables IRI to fulfill role of knowledgeable expert for users
  - Multiple contracts and limited number and complexity of payloads avoids concern of non-profit organization being overwhelmed by a single, large engineering contractor
- E through H not chosen due to
  - concern about ability of non-profit organization to manage and direct the large aerospace engineering contractor required for the engineering integration and operations functions
  - Engineering integration and operations are heavily intertwined with the ISS vehicle engineering and operations and safety of the vehicle and crew with no clean delineation of interfaces to enable transfer of functions to an institute

Global Issues

- Function 2 - Preparing and allocating budgets
  - This function covers the NASA funding process and is inherently governmental - not appropriate in Institute model for Institute lead
  - Institute would support with necessary products
- Function 13 - Advocacy, Manifesting and Resource allocations
  - If manifesting for the IPs is not included in the Institute, a duplicate organization will be required in the government
- Function 18 - Educating and Reaching Out to the Public
  - Given prior NASA experience with institutes, it is considered appropriately governmental to retain the direction and approval of education and outreach strategies and products
- Function 19 - Recommending ISS Pre-Planned Product Improvements
  - Will require integrating vehicle systems and payload/PI inputs. The institute might not have the necessary scope to handle the whole job.

Detailed Issues and Concerns

- 1a - Establish Strategic Plans - includes barter agreements, Enterprise program plans, program/project assignments and authority to proceed
  - considered appropriately governmental, e.g.,
    - Institute cannot assign programs/projects to government organizations or authorize proceeding
    - Enterprises establish strategic program plans
- 1b - Manage Research Programs - includes project authorization to proceed
  - Institute leadership of research programs must be Enterprise/discipline specific
- 3 - Selecting and Prioritizing Research (reference considerations)
  - Science selections for GI programs with non-ISSRC funding are at the discretion of the funding organization
    - Prioritization of selected payloads should be approved by the funding organization

Detailed Issues and Concerns

- 3 - Selecting and Prioritizing Research (reference considerations)
  - Science selections may be perceived to have conflict of interest issues; when Institute staff proposing
  - A non-profit, science organization may not be well-suited to select commercial and technology - organization must be structured to enable knowledgeable commercial and technology selection
- 5 - Developing Cost, Schedule, and Risk Assessments
  - A non-profit , scientifically led organization may not be well suited to provide an independent cost, schedule, and risk assessment for hardware developed elsewhere
- 6 - Developing and Qualifying Flight Research Systems
  - Scope of potential payload development in regards to payload ownership needs to be resolved.
    - Management of development of payloads funded independently must be at the discretion of the funding organization (other enterprises, agencies, industry, private, international, etc.)

Detailed Issues and Concerns

- 6 - Developing and Qualifying Flight Research Systems
  - Institute cannot lead research objectives which are owned by the PI or technology lead
  - The Institute may not lead Independent Verification and Validation of software for payloads they maintain. IV&V must be performed by an organization independent of the payload developer/maintainer.
- 7 - Maintaining and Sustaining Flight Research Systems
  - Payload types need to be considered in this Option. The Institute may not be prepared to manage complex payloads
    - The Institute could be given responsibility for only certain types based on level of complexity or ownership.
  - Management of sustaining payloads owned independently must be at the discretion of the funding organization (other enterprises, agencies, industry, private, international, etc.)

Detailed Issues and Concerns

- 7 - Maintaining and Sustaining Flight Research Systems
  - The Institute may not lead Independent Verification and Validation of software for payloads they maintain. IV&V must be performed by an organization independent of the payload developer/maintainer.
- 8 - Developing Ground Systems
  - This function relates to all ground systems, but should only apply to the ground systems supporting the payloads being developed by the Institute
  - Project approval is appropriately governmental
- 9 - Maintaining and Sustaining Ground Systems
  - This function relates to all ground systems, but should only apply to the ground systems supporting the payloads being maintained by the Institute

Detailed Issues and Concerns

- 13a - Advocacy, Manifesting and Resource Allocations
  - Institute approving allocations for other enterprises/internationals
    - The Partners have accepted the NASA Lead Increment Scientist. An NGO LIS may be difficult to get concurrence for. With Partner issues the appeal route for decisions must go through an ISS Board
  - An Institute should not provide export control policy
  - Prioritizing resource requests will require NASA oversight and may have conflict of interest considerations
  - Institute should only integrate the discipline specific requirements across multiple disciplines and not develop the requirements of the specific disciplines
  - Microgravity working group is a vehicle-wide activity and may be broader than scope of an NGO
  - Code M RPO needs to be discussed with Code M
  - Approving services for payloads from the ISS is appropriately governmental

IRI Workforce Assumptions

- Function 1
  - Supports HQ Enterprise work, RPOs, and ISS Boards
  - Support ramp up in FY05 all additional FTE, 50% of total
  - RPO support in FY07 replaces contractor support at MSFC
- Function 2
  - New FTEs to support NASA budget requirements
- Function 3
  - Assumes new FTE managing 2 GI facility NRAs per year sequentially
  - 1 new FTE to support other appropriate NASA announcements and selections
- Function 4
  - 90% of total workforce corresponds to 90% OBPR payload allocation
  - 50% of OBPR payloads will transition to IRI with corresponding 50% of OBPR workforce

IRI Workforce Assumptions

- Function 5
  - 90% of total workforce corresponds to 90% OBPR payload allocation
  - 50% of OBPR payloads will transition to IRI with corresponding 50% of OBPR workforce
  - 80% of transferred payloads are GI, IRI leads function, workforce transitions
  - 20% of transferred payloads are non-GI, IRI supports, new workforce
- Function 6
  - Work starts to transition in 2008, no FTE shown
- Function 7
  - Facility development complete in FY07
  - Fully supporting 50% of payloads at the end of FY07, transitioning to leading, equating to 50% of contractor FTE
  - 25% of baseline contractor workforce transitioned to IRI

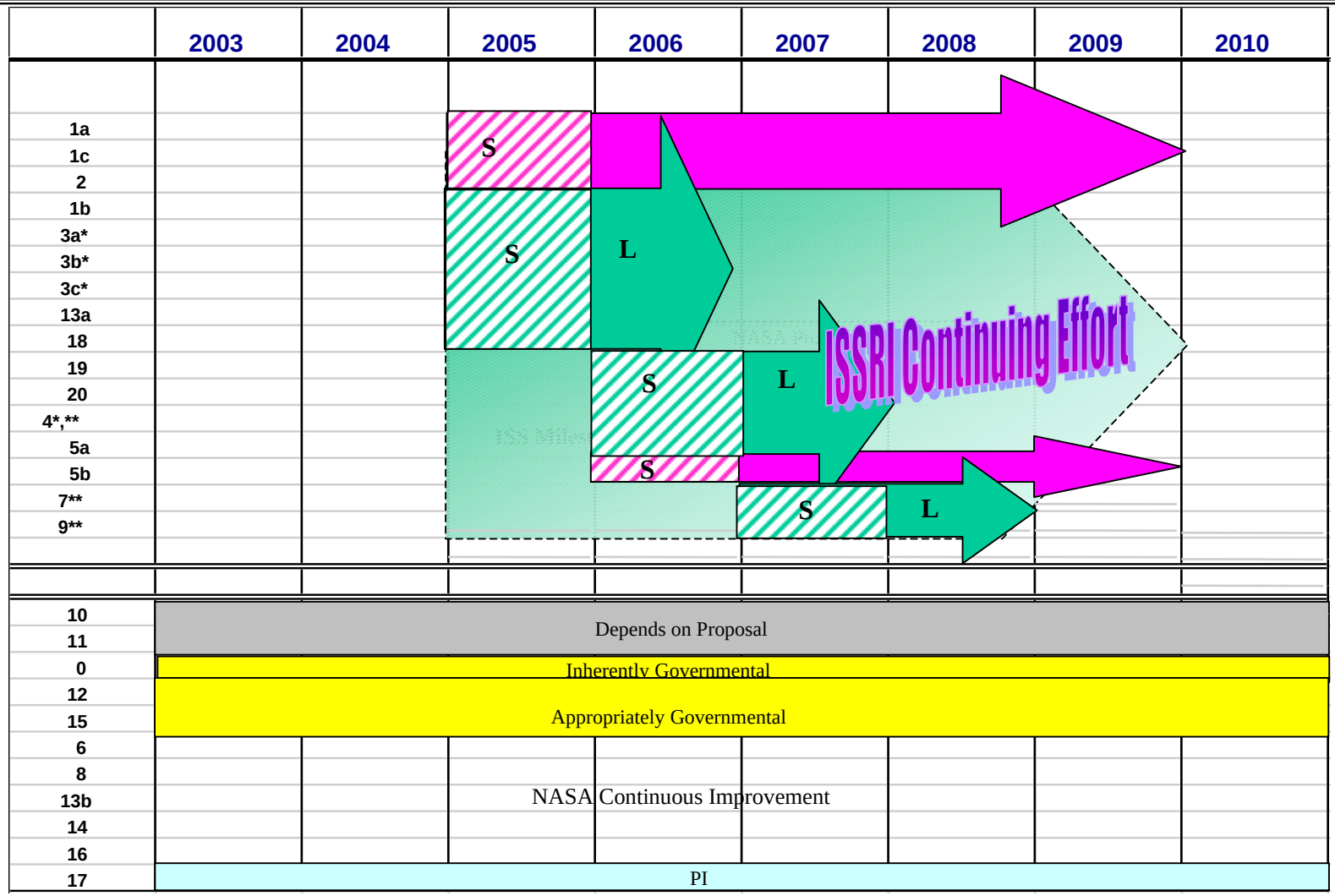
IRI Workforce Assumptions

- Function 8
  - Work starts to transition in 2008, no FTE shown
- Function 9
  - Facility development complete in FY07
  - Fully supporting 50% of payloads at the end of FY07, transitioning to leading, equating to 50% of contractor FTE
  - 25% of baseline contractor workforce transitioned to IRI
- Function 13
  - Supporting in FY05, 50% workforce ramps up, 25% workforce transitions
  - Leading in FY07, 100% total workforce transitions

IRI Workforce Assumptions

- Function 18
  - Supporting in FY05, 50% workforce ramps up, 25% workforce transitions
  - Leading in FY07, 100% total workforce transitions
- Function 19
  - Leading in FY07, 100% contractor workforce transitions
- Function 20
  - Leading in FY07, 100% total workforce transitions

ISS Research Institute (IRI) Transition Strategy



Contract Milestones

NASA Procurement

Award

Option 1

Legend:

= Start up phase **S = Support** **L = Lead** *** = for GI programs** **** = for designated flight systems**