Pluto-Kuiper Belt Mission
AO 01-OSS-01
Preproposal Conference

Science Proposal Review & Evaluation Process

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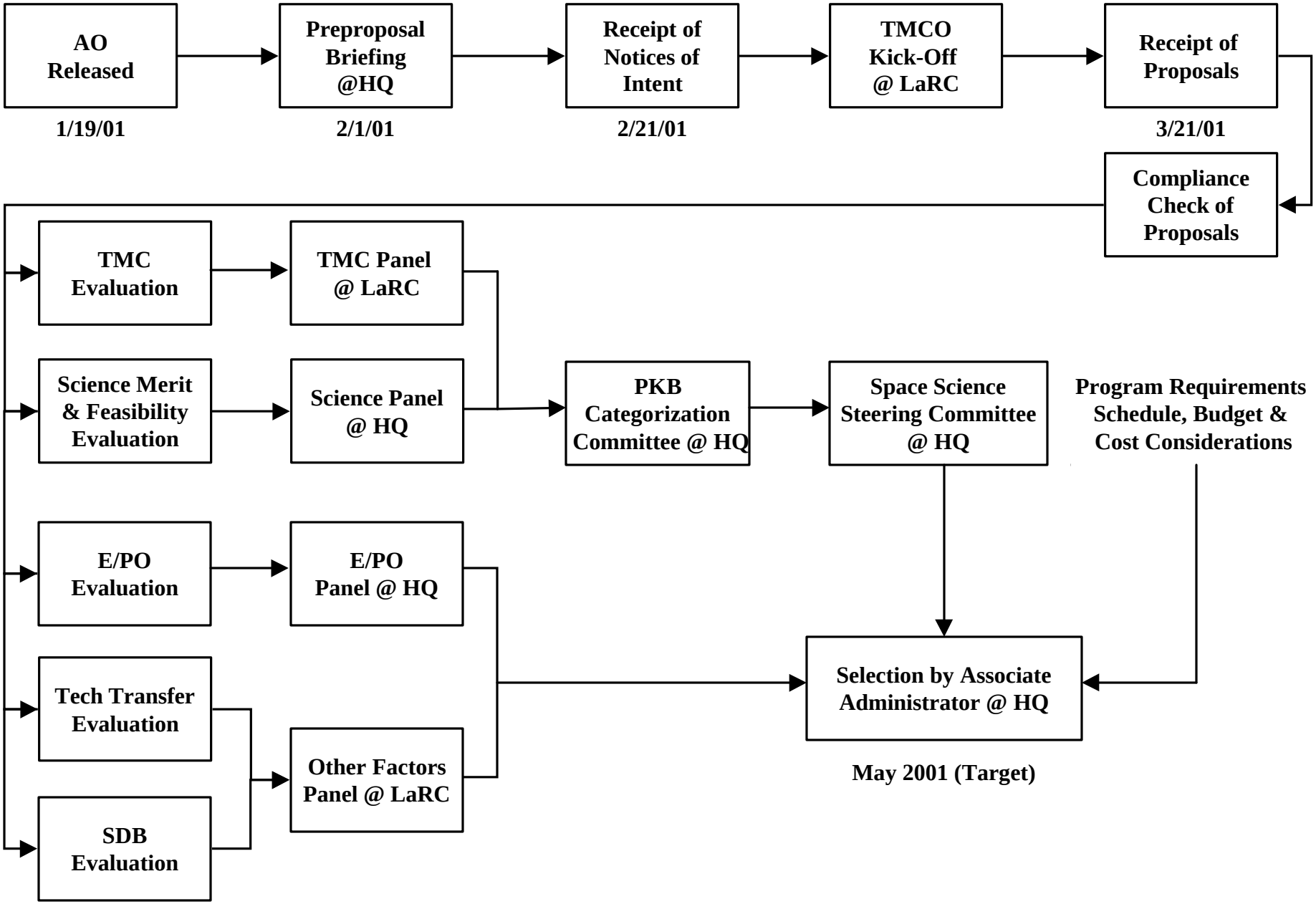
Pluto-Kuiper Belt Proposal Selection Evaluation Flow



PKB Proposal Evaluation Criteria

Proposals are evaluated using the five criteria from AO (Section 6.2.1). These criteria with their approximate percentage weights given in parenthesis are:

- **The Scientific merit of the investigation (30)**
- **The NASA OSS cost (20)**
- **Technical merit and feasibility of the science investigation (20)**
- **Feasibility of the mission implementation scheme (20)**
- **Quality of plans for E/PO, new Technology, and SDB's (10)**

PKB Mission Science Objectives

- The NASA Science Definition Teams considered the range of science objectives appropriate for the referenced Pluto-Kuiper Express mission and prioritized the science objectives.
- Group 1 objectives have the highest priority and are considered of equal priority within that group.
- Group 2 objectives are considered important, but not of the highest priority.
- Group 3 objectives are considered to be desirable, but of a still lower priority.
- **NASA is seeking a mission that can best address these objectives within the budget allowed. All proposals must address, at a minimum, all of the Group 1 objectives. This is defined as the Performance Floor.**
- Proposers are encouraged to include their best effort plan for visiting one or more Kuiper Belt Objects as an extended mission, Phase F option. The budget for this phase will not count against the cost cap. The evaluation of the extended mission will be of secondary importance after the Group 1, 2, and 3 science objectives.

PKB Mission Science Objectives (continued)

- **Group 1 Objectives:**
  - Characterize the global geology and morphology of Pluto and Charon;
  - Map surface composition of Pluto and Charon; and
  - Characterize the neutral atmosphere of Pluto and its escape rate.
- **Group 2 Objectives:**
  - Characterize the time variability of Pluto's surface and atmosphere;
  - Image Pluto and Charon in stereo;
  - Map the terminators of Pluto and Charon with high resolution;
  - Map the surface composition of selected areas of Pluto and Charon with high resolution;
  - Characterize Pluto's ionosphere and solar wind interaction;
  - Search for neutral species including H, H_2, HCN, and C_xH_y, and other hydrocarbons and nitriles in Pluto's upper atmosphere, and obtain isotopic discrimination where possible;
  - Search for an atmosphere around Charon;
  - Determine bolometric Bond albedos for Pluto and Charon; and
  - Map the surface temperatures of Pluto and Charon.

PKB Mission Science Objectives (concluded)

- **Group 3 Objectives**
  - Characterize the energetic particle environment of Pluto and Charon;
  - Refine bulk parameter (radii, masses, densities) and orbits of Pluto and Charon;
  - Search for magnetic fields from Pluto and Charon; and
  - Search for additional satellites and rings.

Science Evaluation Process

- **Science Evaluators are:**
  - Best (non-conflicted) academic, CS, contractor, consultant, and other Government personnel available to support the review.
  - Peers in the areas of expertise they evaluate.

- **Science Findings are the consensus of the entire Science Panel**
  - Every proposal is evaluated by multiple reviewers with a mixture of discipline expertise.
  - All proposals and findings discussed by the entire Science Panel.
  - Final ratings are agreed by the entire Science Panel.

Science Evaluation Factors

- **Scientific Merit:**
  - How well does the mission fill important gaps in knowledge and/or provide for fundamental progress in planetary system(s) science?
  - Does the proposed investigation support or complement ongoing missions or provide ancillary benefits to planetary system(s) science?
  - At the Performance Floor, will the investigation still have high scientific value?
- **Technical Merit and Feasibility:**
  - Can the proposed investigation approach (measurement objectives, data analysis, etc.) be expected to achieve the proposed scientific goals and objectives?
  - Does the science investigation team have the appropriate expertise, experience, and organizational structure to successfully complete the proposed investigation?
  - Will the proposed instrumentation support the measurement objectives of the investigation (appropriate type of data with necessary resolution, dynamic range, sensitivity, SNR, etc.)?
  - Will the volume of data returned be sufficient to complete the investigation?

Science Evaluation Factors (concluded)

- **Technical Merit and Feasibility: (concluded)**
  - Resiliency: In the event of development problems, will the proposed descoping plan permit “graceful degradation” to the Performance Floor?
  - Data analysis and archiving: Is there an approach for designing and delivering standardized (PDS) data products? Will data be released to the public domain in a timely fashion? Does the data analysis plan specifically include physical interpretation and publication of results in refereed journals? Are there adequate resources to accomplish these tasks?
  - Does the proposal offer a PSP or DAP or an Optional Extended Mission?