

Integrated Project Delivery Centre – Terms of Reference

Purpose & Scope

The Integrated Project Delivery Centre (IPDC) will provide the community with the highly skilled engineering and technical resources required in the design, fabrication, and assembly of the major international experiments that will be undertaken during the next decade. The IPDC will be distributed strategically across Canada in several hubs to best suit the needs of the community. The Centre will be managed by a lead engineer, following the guidance of a pan-Canadian prioritization board (the Resource Allocation Committee) that will review the demands on the resources on a regular basis to ensure the projects are getting appropriate, sufficient, and dedicated resources at the time that they need it.

This document defines the roles and responsibilities of the IPDC and describes the framework for soliciting requests for support, reviewing requests, assigning resources, and monitoring progress.

Definitions & Responsibilities

Project Feasibility Committee (PFC)

- Consists of IPDC Management (Manager + Deputy Managers) + 1-2 others familiar with the technical requirements (may include IPDC Technical Staff or other delegates).
- Meet as needed to:
 - Review Project Applications for completeness and solicit more information from the Project Applicant, if needed.
 - Create/contribute to Project Tickets.
 - Consult with the Scientific Director or Associate Scientific Director as needed, to verify that a Project Request is aligned with the McDonald Institute research strategy. Projects Requests that are not well-aligned may be returned to the Applicant for discussion, or, if appropriate, declined.
 - Prepare an opinion on the feasibility of requests (Feasibility Assessment) and submit this to the Resource Allocation Committee (RAC). Details on the suggested content for this Assessment are addressed below in the Application Process section.
 - Assess progress on projects, looking at how projects are developing compared to when the resource was awarded, and how the allocation may need to be adjusted in response.
- Meet annually to:
 - Conduct a skills-gap analysis to identify opportunities for IPDC Professional Development, new staffing, or other technical resources (e.g., training, conferences, engineering codes/standards, software packages, computers).
 - Submit recommendations for changes to next year's program and budget to the RAC.

Resource Allocation Committee (RAC)

- Receive and review Feasibility Assessments from IPDC Management for Project Applications.
- Determine whether a project will be supported and determine the overall priority of supported projects by comparing against the McDonald Institute scientific strategic plan and its priorities.
- Capture records of RAC decisions and their justifications.
- The RAC will maintain a regular meeting schedule, meeting several times per year, and will also meet as needed to consider more urgent or unexpected requests.
- On an annual basis, receive and consider requests for changes to the IPDC program and budget. Final recommendations must be submitted by the RAC to MI Senior Leadership for consideration.

Project Applicant

- Prepare and submit a Project Application to apply for technical resources from the IPDC.
- Develop the Design Scope Specifications or Project Scope Specifications jointly with IPDC Technical Staff.
- Project Applications should typically be submitted by those holding leadership positions within an experiment (e.g., PIs, WBS managers), though IPDC Management will consider reasonable requests that align with McDonald Institute research goals from any community member.

Project Ticket & Project Tracker

- Project Tickets contain the official, detailed repository of all engineering requests, their status, feasibility evaluation, deliverables, resource assignments, and communication history. Tickets support input from any assigned IPDC Technical Staff, are audited for completeness by the Project Officer, and are formally closed out by IPDC Management.
- The Project Tracker provides a snapshot of current and forecast assignments for IPDC Technical Staff, viewed from a personnel loading perspective. This tool is intended to support “at-a-glance” balancing and forecasting. The Tracker is maintained by IPDC Management and/or the Project Officer.

IPDC Manager

- Resource allocation:
 - Reviews Project Applications and convenes meetings with the PFC to complete project feasibility review (Feasibility Assessment).
 - Considers and authorizes work to begin on Level 2 (small-medium) tasks without consulting the RAC, if the Manager expects it can be reasonably accommodated within the indicated timeline from the threshold table below.
 - Prepares or approves Feasibility Assessments and submits to the RAC.
 - Sits on the RAC to communicate the feasibility assessment for Project Applications and discuss progress updates for ongoing projects. Does not vote on the scientific merit of projects.
 - Communicates decisions from the RAC to the Project Applicants and IPDC Technical Staff.

- Determines or approves the oversight required for projects that the IPDC is supporting (i.e., who is responsible for supervising and approving engineering/designs/QA/QC). Suitable options may include:
 - Experiment Manager or Principal Investigator (PI).
 - Intermediate or Senior IPDC Technical Staff.
 - In some cases, a suitable Professional Engineer must approve engineering work.
- Maintains the Project Tracker in collaboration with the Project Officer.
- Formally closes out Project Tickets, whether completed or discontinued.
- Operations:
 - Completes quarterly check-ins with IPDC Technical Staff to review progress and monitor alignment with project priorities.
 - Day-to-day coordination of IPDC Technical Staff will not be done by IPDC Management and is expected to be managed by the Local Institution Host, unless agreed to under special circumstances (e.g., coordination of direct reports at the local institution, or mentorship of an EIT).
 - Approves Design/Project Scope Specifications.
 - Investigates, recommends, and implements resolutions in case of disputes (e.g., team member tracking shows poor alignment with assigned project priorities).
 - Provides reports to the RAC on disputes and resolution measures.
 - Approves purchase requests for technical expenses of in-budget items and consult MI Senior Leadership for other expenses.
- Organization:
 - Reports to the Scientific Director.
 - Makes recommendations for promotions or disciplinary action for IPDC Technical Staff to MI Senior Leadership.
 - Convenes the PFC annually to discuss and recommend changes to the IPDC program and budget.
 - Participates in development of IPDC annual budget.

IPDC Deputy Manager(s)

- Sits on the PFC and participates in project feasibility reviews.
- Considers and authorizes work to begin on Level 2 (small-medium) Requests without consulting the RAC if the Deputy Manager expects it can be reasonably accommodated within the indicated timeline from the threshold table below.
- Some Manager responsibilities may be delegated to Deputy Managers, as appropriate. For instance, it may be more appropriate for a deputy to complete check-ins or approve Design Scope Specifications where the subject matter is well aligned with their field(s) of expertise.

IPDC Project Officer

- Maintains Project Tracker monitoring the current and forecast IPDC Technical Staff project assignments and workload.
- Prepares reports summarizing the breakdown of time spent on project assignments for IPDC Technical Staff.

- Audits the Project Ticket repository and Technical Staff Time Tracking documentation for completeness.
- Maintains and organizes web page, documents, and records relating to the IPDC (governance documents, IPDC web page, application forms, Project Ticket repository, Project Tracker, minutes from meetings, Project technical files).

Local Institution Host

- This is the PI at each institution responsible for hosting their local institution IPDC Technical Staff. The Local Institution Hosts are those individuals identified in the McDonald Institute Interinstitutional/Collaboration Agreement.
- In accordance with policies of their institution:
 - Provides a suitable workspace and workstation for each of their Technical Staff.
 - Provides day-to-day supervision and manages working hours and leave requests for their local Technical Staff.
 - Provides time during normal working hours for Technical Staff to complete appropriate professional development and training activities. MI will support reasonable costs for this, up to budget limits.
- Considers and authorizes work to begin on Level 0 (small-medium) tasks without consulting with IPDC Management or the RAC. The Host may allocate a maximum of 20% FTE for each of their 1.0 FTE Technical Staff, averaged monthly.

IPDC Technical Staff (Engineers/Designers, Machinists, Technicians, Technologists)

- Report requests for engineering/design or machining/fabrication resources to IPDC Management for all Level 2 or higher Requests (see Thresholds description below).
- Create/contribute to Project Tickets and Design/Project Scope Specifications for assignments.
- Participate on the PFC as requested to help inform Feasibility Assessments.
- Participate in quarterly check-ins with IPDC Management to monitor progress and re-align priorities.
- Complete annual professional development activities as required.
- Organize personal workflow in alignment with assigned project priorities.
- Track hours spent on all projects.
- Provide engineering/design solutions and/or machined/fabricated components according to the priorities assigned by IPDC Management.

Participating Institutes

- Vancouver Hub: 3 Technical Staff across:
 - Simon Fraser University
 - TRIUMF
 - University of Victoria
- University of Alberta Hub: 2 Technical Staff
- Queen's University Hub: IPDC Manager, Deputy Manager, 5 Technical Staff, and Project Officer
- Carleton University Hub: 3 Technical Staff
- Montréal Hub: 2 Technical Staff across:

- McGill University
- Université de Montréal

Application & Project Lifecycle

Phase 1A: Submit Project Application.

- Project Applicant submits an application.
 - A website application or form will be provided with input prompts needed to populate a Project Ticket. All Level 2 or higher Requests must be formally submitted by the Project Applicant through the website.
 - Level 0 and 1 Requests may be optionally submitted informally (e.g., verbal discussion, informal email/Slack/Teams) to IPDC Technical Staff.
- The Application must cover:
 - Applicant name, institution, contact info, and date of submission
 - Title (short description of request)
 - Basic technical requirements and deliverables
 - Personnel - Estimated FTE requirements, specialties, proposal for oversight for work (who will supervise and approve work)
 - Preliminary budget
 - While the engineering services provided to the astroparticle physics community are free, the Applicant should include an anticipated budget that would include Applicant costs for materials/equipment, and ancillary costs that the IPDC may be requested to incur to support the work (e.g., this might include specialized training, software, or tools). This information will help the IPDC assess the feasibility of delivering the project within the available or expected funding.
 - The Applicant must declare the status and source of funding for the project, noting that the IPDC will still consider requests from unfunded projects.
 - Preliminary schedule
 - Risk - Are there high-risk items to consider? For example:
 - Regulatory, legal, or IP implications
 - Unique technical challenges, novel or immature technologies
 - Funding not secured
 - Hard deadlines

Phase 1B: Initiate a Project Ticket.

- IPDC Management will conduct an initial screening of incoming Tickets and may follow up with the Applicant or Ticket initiator.
- The Ticket will be developed as the project is assessed and moves through its lifecycle phases 2-5, described below. At onset, the Ticket will include the details from the Application, as described above.

Phase 2: Determine Request Level and review thresholds.

- Authorization to allocate resources for a Project Application is based on the thresholds below.
 - All projects must be aligned with the McDonald Institute research goals.
 - Level 0 Requests are reasonable requests in support of the priorities set by the Principal Investigator hosting IPDC Technical Staff at their local institution. Except under special circumstances agreed upon by IPDC Management, each 1.0 FTE IPDC Technical Staff should allocate no more than 0.2 FTE combined across all L0 Requests, averaged monthly.
 - Level 1 Requests are reasonable and small requests from community members that can be accepted and completed by the individual receiving the request if they believe it can be reasonably accommodated within the indicated timeline from the threshold table below. Except under special circumstances agreed upon by IPDC Management, each 1.0 FTE IPDC Technical Staff should allocate no more than 0.1 FTE combined across all L1 Requests, averaged monthly.
 - All Level 2 or higher Requests must be forwarded to IPDC Management for consideration.
 - The IPDC Manager or Deputy Manager(s) have the authority to approve Level 2 Requests and assign resources.
 - Level 3+ Requests must be reviewed and approved by the RAC.
- Tasks, small, medium, and large – Technical Staff working on tasks these bring a specialized set of skills (e.g., pressure equipment design, gas panel design, installation fixture engineering, cryogenics, electronics, machining, fabrication) and will complete these tasks with clearly defined scope on an as-need basis for the experiments. These Staff may supervise tasks that Junior or Project Engineers are working on.
- Project Engineer – Project Engineers get wholly integrated into the experiment. Tasks for Project Engineers are typically directed by managers or PIs representing experiments. Task oversight & guidance may be given by more senior staff within the IPDC. Typically, Project Engineers will remain in one experiment for >1 year and may have additional assigned responsibilities within the organizational structure of the experiment.

Level	Type	FTE (per 1.0 FTE)	Timeline	Authorization
0	Local institution support	<0.2 total	--	Discretion of hosting PI at the local institution
1	Task, Small, ad-hoc	<0.1 total	1-2 person-days/month	Discretion of individual receiving request
2	Task, small-medium	<0.2 each	Person-week over a few months	PFC review + IPDC Management approval
3	Task, medium	0.2+ each	<1 year	PFC review + RAC approval
4	Task, large		1 year +	
5	Project Engineer		1 year +	

Phase 3A: Complete Feasibility Assessment.

- A Feasibility Assessment is prepared. The responsibility for the assessment depends on the Request Level:
 - Level 0, 1 – Completed by the individual receiving the request
 - Level 2 – Completed by the Project Feasibility Committee (PFC)
 - Level 3+ – Completed by the PFC, then submitted to the Resource Allocation Committee (RAC) for review.
- The Assessment must consider:
 - Technical – Can the IPDC provide a technical solution for the request? Will outside engineering resources be required to support this request?
 - Personnel – Who on the team has the technical skills to support the request? What FTE loading is needed? What oversight is required and who will provide it?
 - Budget – Is funding secured for the request? Is the budget realistic?
 - Schedule – Can the IPDC provide the deliverables on the requested timeline?
 - Impact on other assignments – Will this project create conflicts with other IPDC priorities?
 - Risk – Are there high-risk items to consider? For example:
 - Regulatory, legal, or IP implications
 - Unique technical challenges, novel or immature technologies
 - Funding not secured
 - Hard deadlines

Phase 3B: Resource Allocation Committee reviews applications and allocates resources.

- For Level 3+ Requests, the RAC and IPDC Manager will meet to discuss and determine prioritizations and resource allocations.
- Prioritization will be done on the basis set out in the Resource Allocation Committee section above.

Phase 3C: Communicate decision to Applicant.

- Approved projects and details of any deviations from the initial request will be communicated to the Project Applicant.
- Declined projects and the reasoning will be communicated to the Project Applicant.

Phase 4A: Commence work.

- IPDC Management will assign Technical Staff to Projects.
- The Project Applicant and assigned Technical Staff will jointly finalize the Design/Project Scope Specifications (DSS/PSS), covering the scope of work, deliverables, budget constraints, schedule, oversight, and QA/QC requirements.
- The IPDC Manager will approve the DSS/PSS and work may commence.

Phase 4B: Review progress and reassess priorities.

- The Project Applicant may request changes to the DSS/PSS at any time. Significant changes in scope may trigger a review of some steps of the Application Process.

- IPDC Management will monitor project progress and meet with the PFC as needed to review progress and/or reassess feasibility.
- The RAC will review progress and reassess priorities at each meeting of the Board.
- Any changes to project priorities or resource allocations will be communicated to the Project Applicant.

Phase 5: Close out completed or discontinued projects.

- The Project Ticket will be officially closed out by IPDC Management.
- The Project Applicant will be invited to participate in a satisfaction interview/survey.