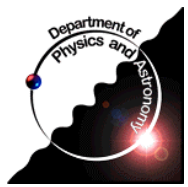
ATLAS Endcap Signal Feedthrough Project

- Overview
- Status
  - Procurement of components
  - Feedthrough production
  - QA/QC
- Schedule
- Budget and Management
- Conclusions

10th meeting of the
National Research Council
Advisory Committee on TRIUMF
(ACOT)
May 4-5 2001



Michel Lefebvre
University of Victoria
Physics and Astronomy

Overview

ATLAS liquid argon calorimetry has over 180k signal channels which must come through the walls of the cryostats

Each feedthrough unit carries 1920 electrical channels.

Barrel: 64 feedthrough units (+spares)

Endcap: 50 feedthrough units total (+5 spares)

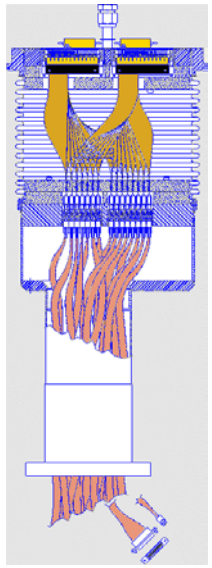
The endcap signal feedthrough project is an ATLAS common fund contribution from Canada

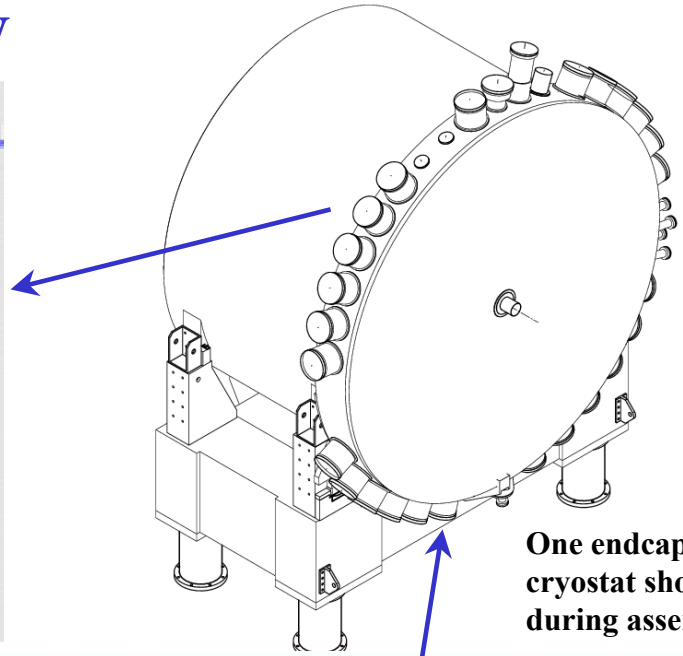
Part of the ATLAS Cryostat and Cryogenics Project

Extensively reviewed

ATLAS reviews
Project Review, BNL, Jun 12-13 1997
Baseline Design review CERN, Oct 13 1997
Production Readiness Review, CERN, Jan 29th 1999

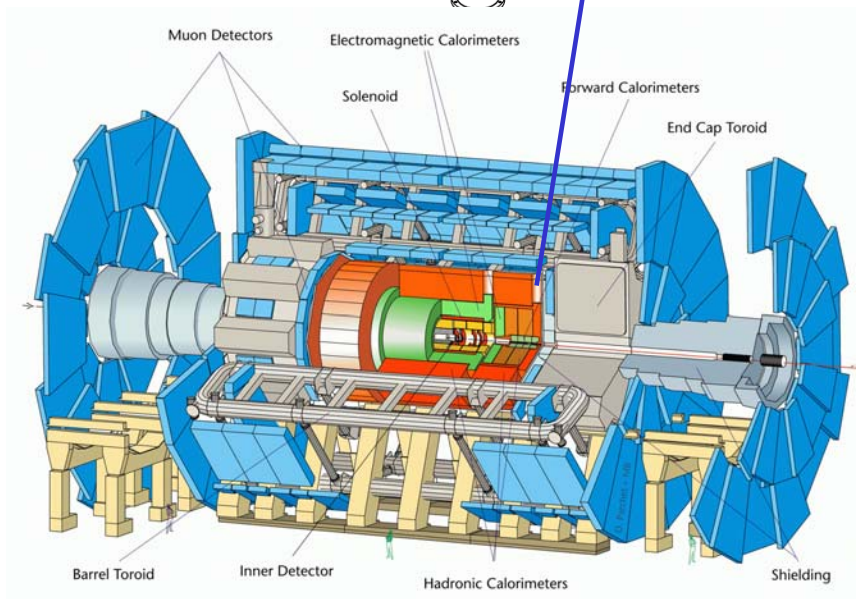
NSERC reviews
TRIUMF, Jan 9 2000
TRIUMF, Oct 19 2000



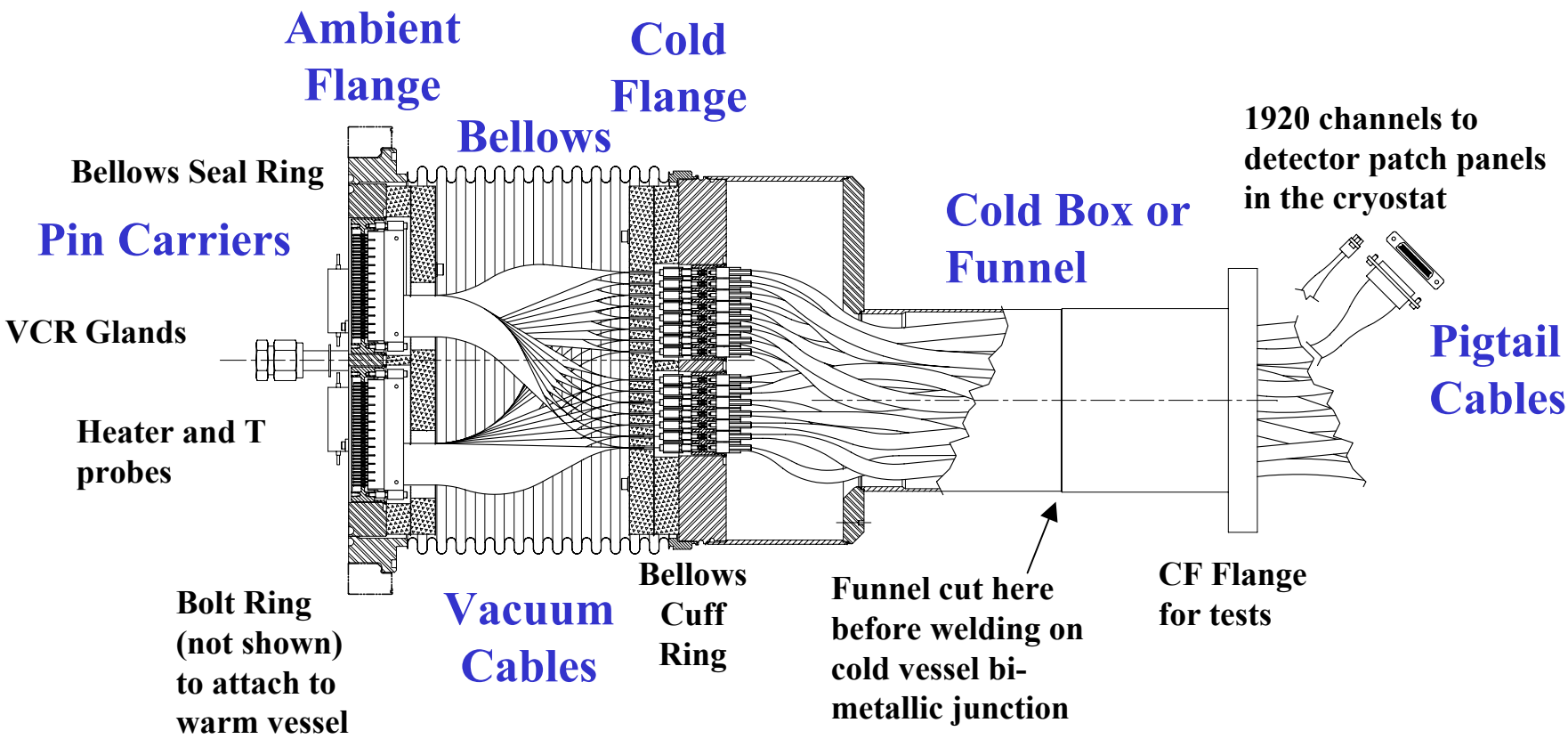


One endcap cryostat shown during assembly

Alberta
Carleton
CRPP
Montréal
Toronto
TRIUMF
UBC
Victoria
York



Overview



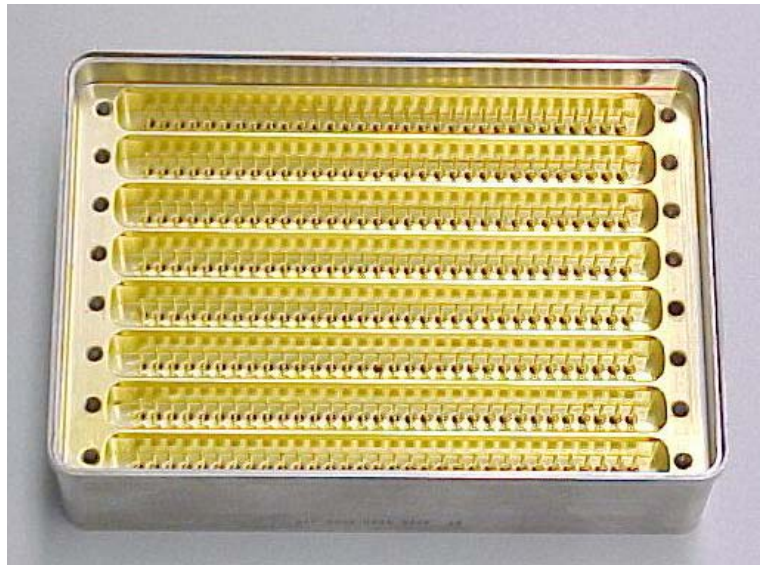
Seal ring OD = 326.4 mm

Total height = 699.9 mm

Status: procurement of components

pin carriers

- Production halted August 2000 due to low inclusion steel problems
- Production restarted February 2001. All problems solved.
- HCC/GSP followed very closely, coordinated by Tom Muller at BNL
- HCC now machining over 20 parts/week, GSP now producing over 15 parts/week
- UVic has received 48 units so far
- 24 units expected mid May to test our production capability



Status: procurement of components

Other Mechanical Components

ambient flanges, cold flanges, bellows assemblies (bellows, cuff rings, seal rings), funnel assemblies, heaters components, rohacell

ALL IN STOCK

Ambient flange glands

more to come from CERN

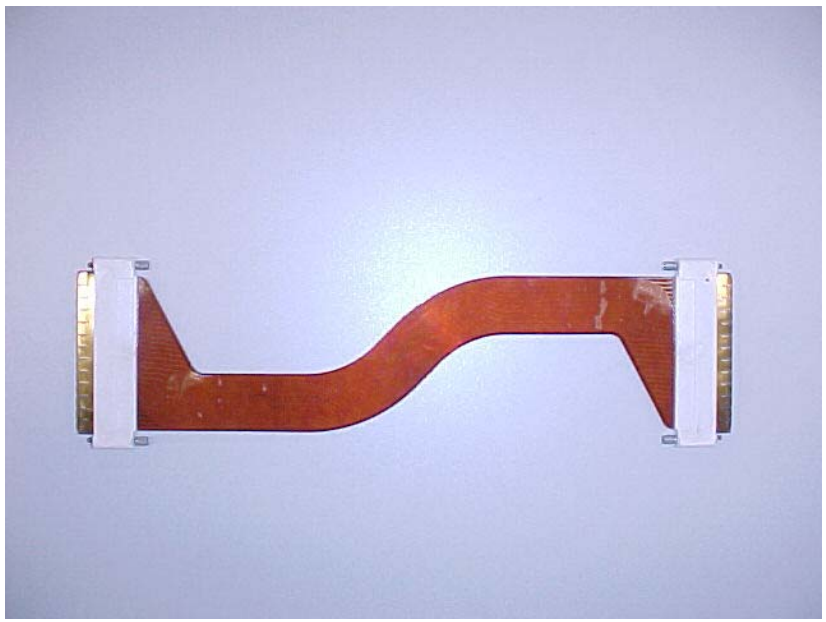
Status: procurement of components

Electrical Components

Pigtails (7 types, require 750 for one endcap)
1043/1692(ordered) or 62% received

Vacuum cables (2 types, require 750 for one endcap)
1554/1790(ordered) or 87% received

We have all we need for the first endcap



Feedthrough Production

At the University of Victoria

as of 02/05/2001 **5 feedthrough units produced**

1 feedthrough unit under construction

vacuum cable installation

Feedthrough Production

welding of feedthrough

crated feedthroughs

Quality Assurance / Quality Control

- **QA/QC is critical to the success of the project**
- **Very detailed document released (QA/QC version 010330)**
- **All TIS (CERN Safety) concerns have been addressed**
- **Procedures and documents under intense scrutiny as the first feedthroughs are built**
- **All information stored in a purpose-built database**

Schedule

Feedthrough production is constrained mainly by two factors

Pin carrier procurement

HCC/GSP goal is a production of 30 pin carriers/week

the current production rate is about 15/week, and increasing

UVic share must be negotiated with BNL and ATLAS

24 pin carriers to be sent to UVic by mid May to test our production capability.

Production capability

we aim at a peak rate of at least 3 feedthrough units/month
special feedthroughs (11/55) may take more time

at this rate, the first 25+2 units would be done by Mar 2002
the last 25+3 units would be done by the end of 2002

although tight, this is compatible with the first endcap cryostat readiness for feedthrough installation at CERN

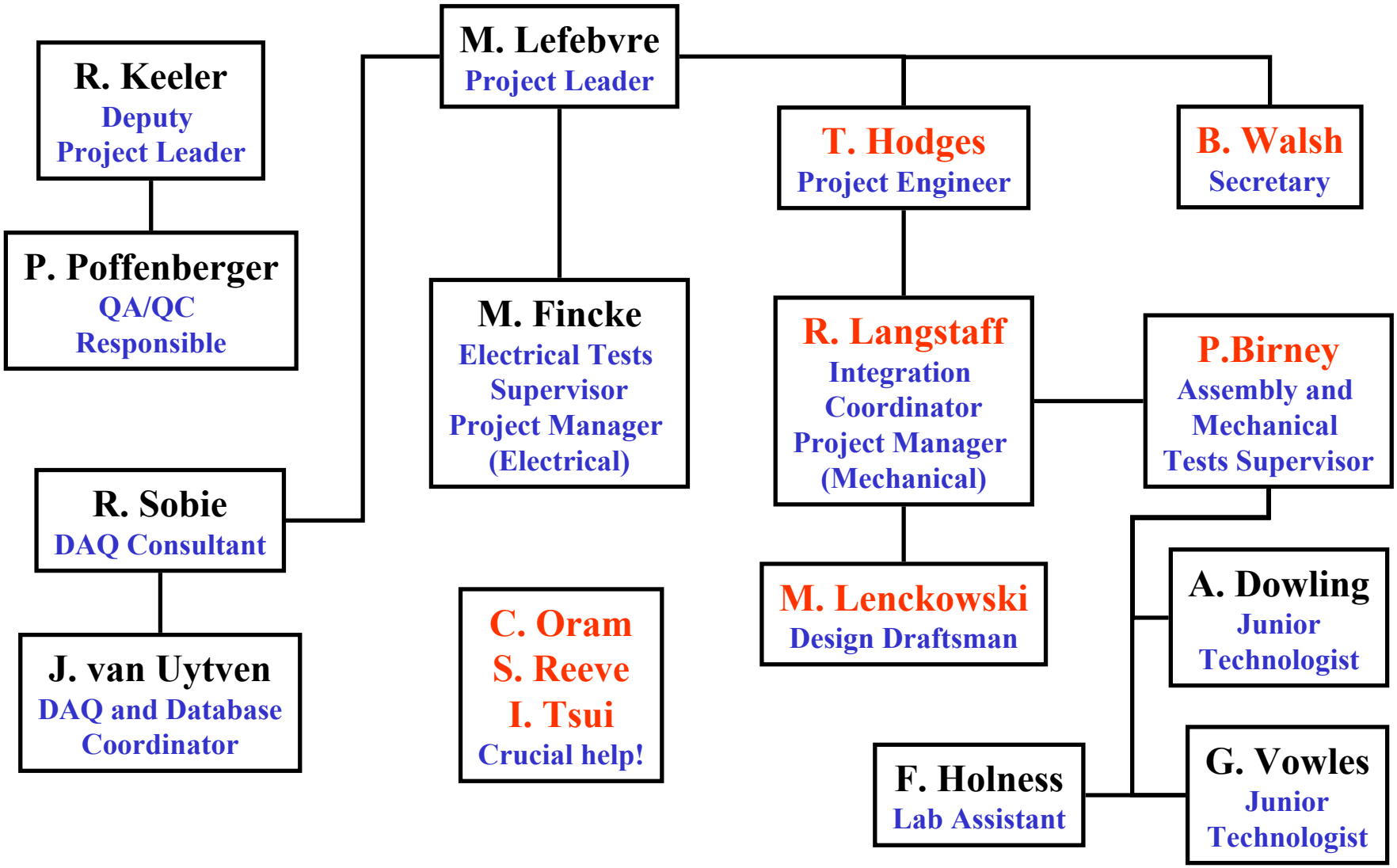
Budget and Management

Responsibilities

- Design
- Fabrication
  - Signal Pigtails purchased from Orsay
- Commissioning
- Transport
- Reception
  - Electrical and ambient vacuum testing
  - Leak tester provided by ATLAS CERN
- Electrical tests after installation
- Assistance during installation
  - Up to SF50k towards the cost of an orbital cutter
  - Assistance during welding on the cryostat
  - Assistance for leak testing during/after installation
- Still under discussion
  - Manpower to connect warm cables to ambient flange

Budget and Management

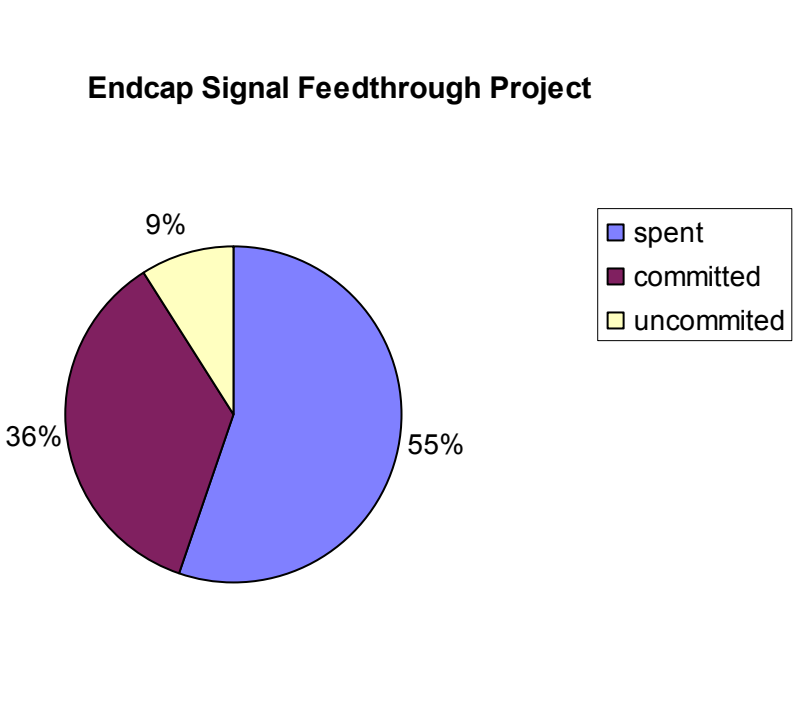
Organizational Chart

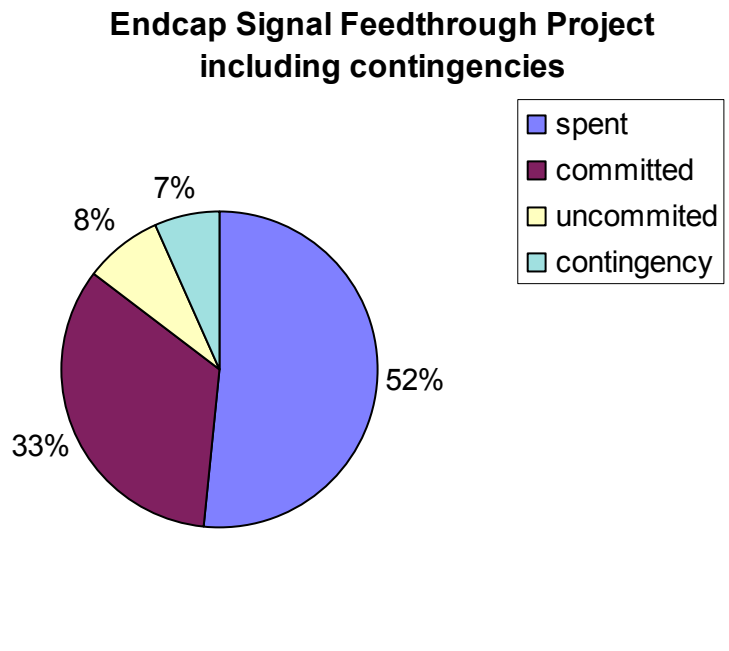


Budget and Management

Budget Status

MIG amount:	$4.280M
Current budget:	$4.026M
Contingencies:	$0.285M





Conclusions

Endcap Signal Feedthrough Project

- Crucial component of ATLAS LAr
- Complex and manpower intensive
  - UVic and TRIUMF personnel
- Production has started
  - 5 units built and tested
  - Proceeding cautiously with emphasis on QA/QC
- Extensive QA/QC programme
- All components (except pin carriers, pigtails, and flange glands) are in hand
- Pin carrier production now in good shape
- Production rate still in line with cryostat schedule
  - Pin carrier procurement on critical path
  - To be reassessed when pin carrier procurement reaches full rate
  - Production capability to be tested May-June 2001
- Budget within the allocated MIG
  - Built-in contingencies
  - 91% of baseline costs either spent or committed