

A Great Games is Great TV



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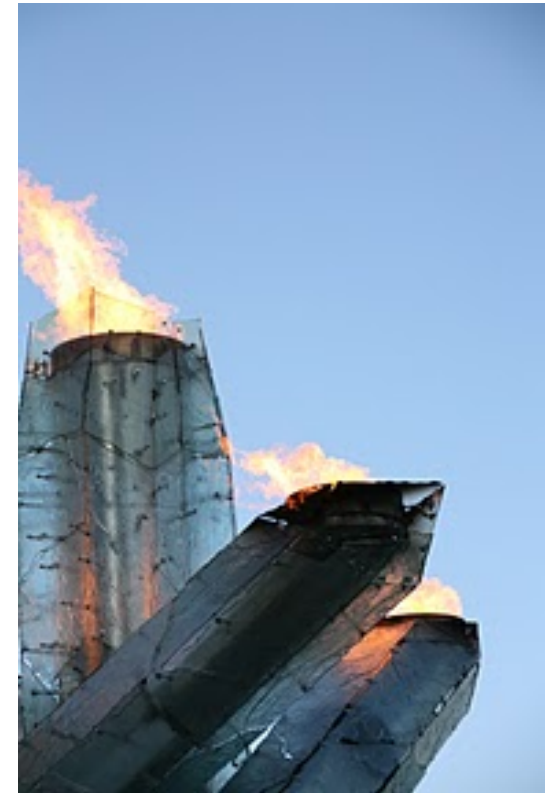
My role

- Broadcast Prime responsible for Olympic Broadcast Services Vancouver (OBS) and all TV and Radio Connectivity
- Venue Telecom Manager of the International Broadcast Centre.



Things you will learn today

- Forecasting Olympic games order volume
- Flawless means simple
- No amount of planning is enough, but most of it is a waste of time.



Disclaimer

- Some items and information is purposefully left out of this presentation to respect the confidentiality of Bell's Olympic partners

Key Decision

“FLAWLESS”

We decided in 2004

If you decide to do flawless it impacts every decision you make, and not just technology

Staff Levels, Training, Health and Safety, Human Logistics, Equipment Sparing, what you do, and what you don't do

To IP or Not to IP?

- An all IP solution
 - All services delivered over an IP/Ethernet including Voice, Data, and even part of the CATV solution.
 - Two exceptions, OBSV Video, ISDN

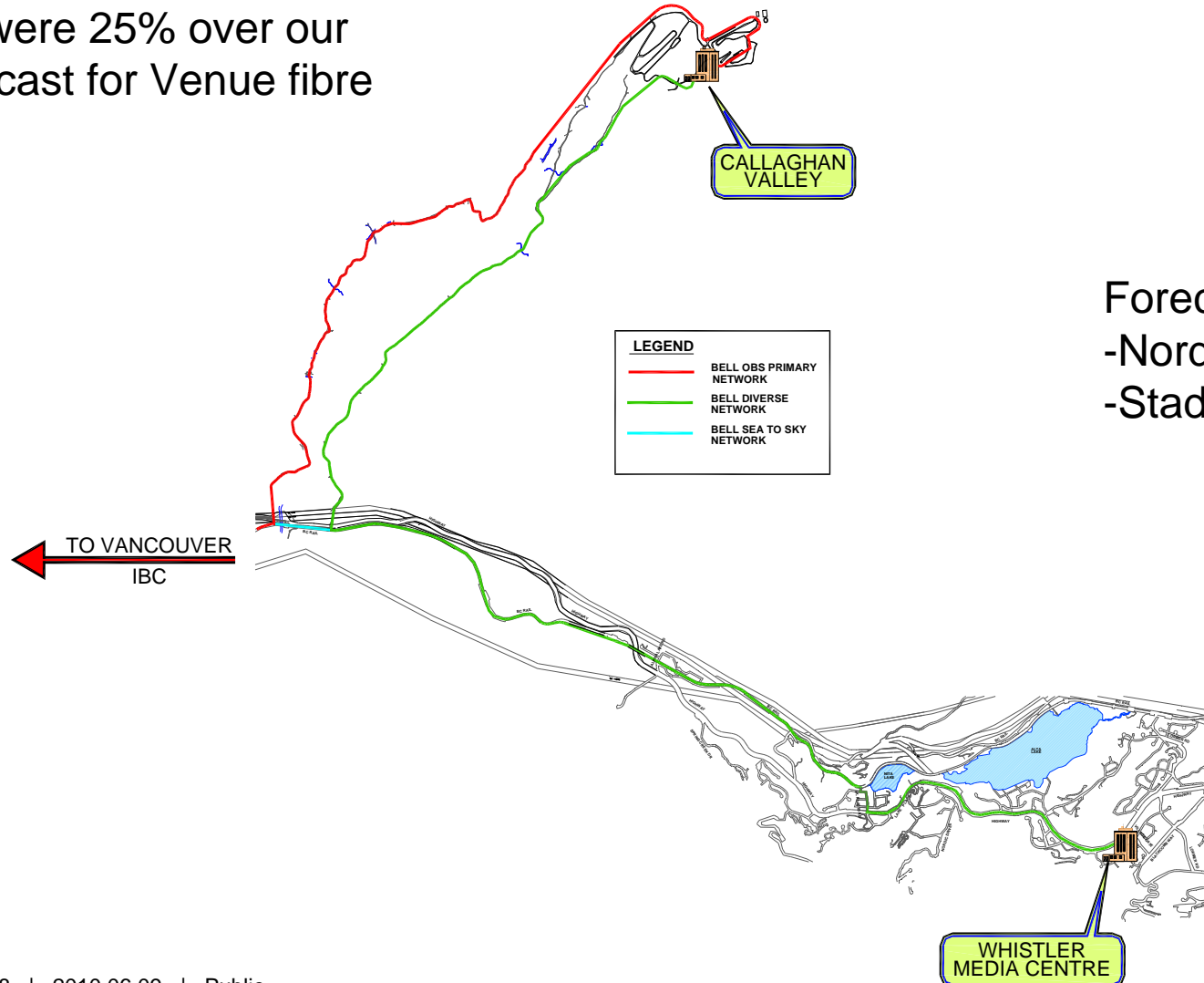


Broadcast elements

- VandA – Video and Audio between the venues
- POTF - partially outside the fence
- TOTF – Non-accredited Media
- ROW – Rest of World
- CATV – Inside Venues

Venue Fibres for Sea to Sky and WOP

We were 25% over our Forecast for Venue fibre



Forecast Challenges
-Nordic Sports
-Stadium/Hockey1

Sea to Sky

- 130km - about 26dB path loss on Primary Route
- one shot, +7db Lasers on the primary route
- The secondary route was older fibre so a repeater was required in Squamish

POTF's

- Partial outside the fence
 - “country houses”, community “live sites” and those wonderful beauty shots
 - not provided on redundant facilities, No impact on primary broadcast signal or timing and scoring.
 - Great forecast! We planned on 10-12. We delivered on over 35 locations.

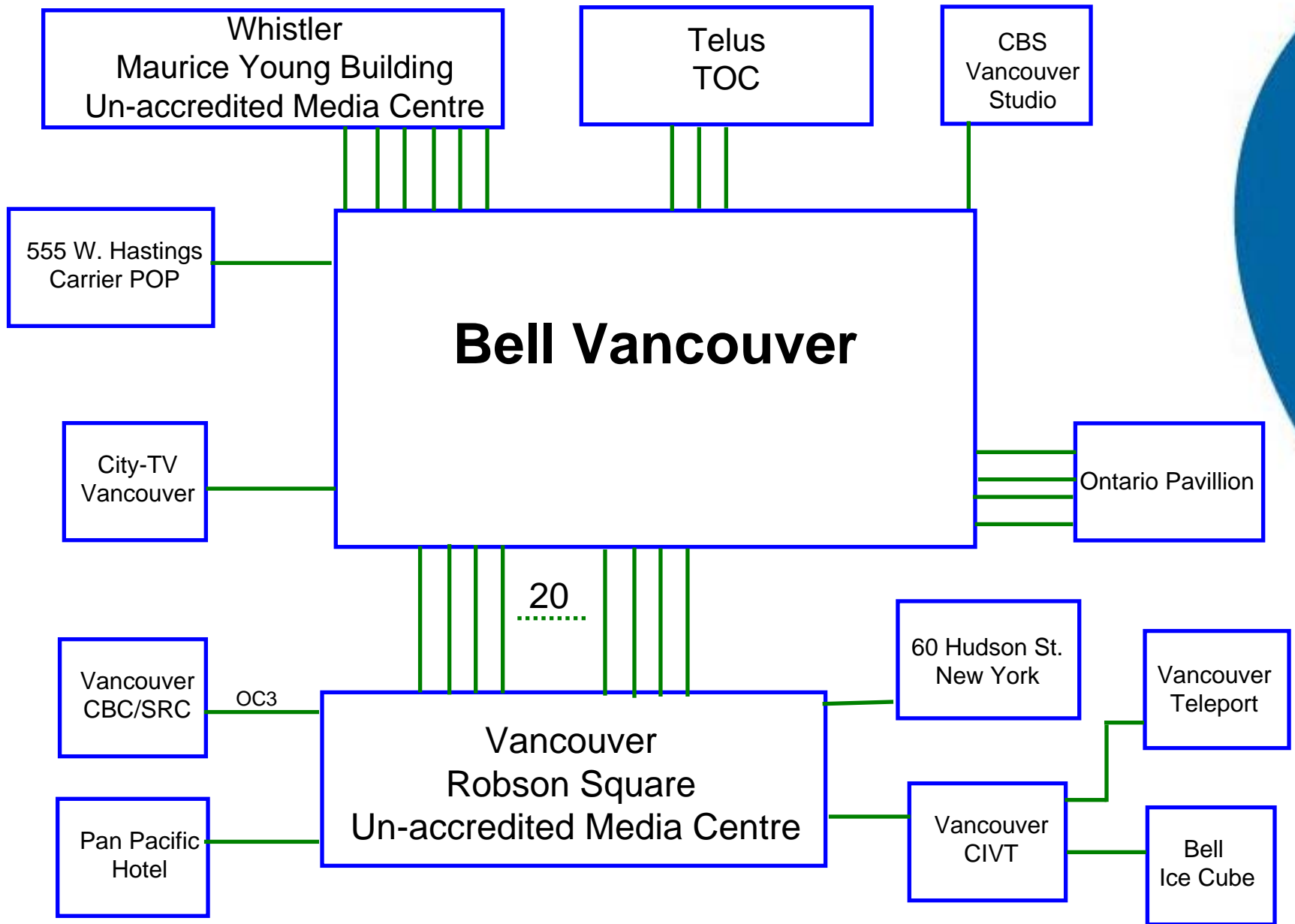
TOTF's or Non-accredited Broadcasters

- About 40 local loops of NTSC, SDI, HD-SDI, and OC-3
 - Two main locations
 - Robson square – 24 circuits
 - Maurice Young (Whistler) , 8 circuits
 - Other locations
 - Local Broadcasters,
 - Ontario Pavillion
 - The Bell Ice Cube
 - 60 Hudson St. (New York)

Non-accredited Broadcasters

- City-TV
- CBC/SRC
- Global
- 7 Network
- ESPN
- TVN Poland
- Ghana
- CNN

Non-Accredited Media Network

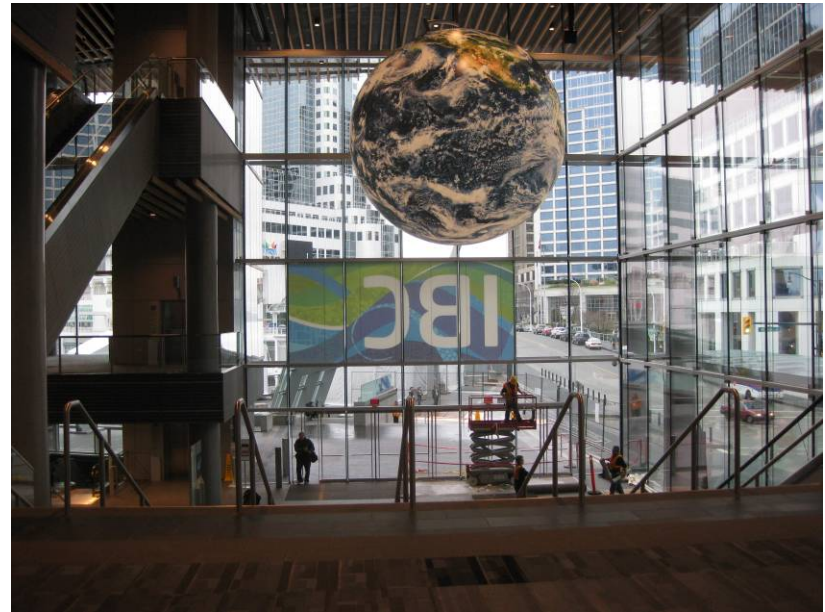


52 National Broadcasters



Rest of World

- ROW
 - DS-3, OC-3, OC-12, and OC-48
 - Only 4 “Video” circuits
 - Very little Satellite.
 - Delivered as a “long local loop” to New York, Seattle, Toronto, and Los Angeles.
 - We built two 10Gig rings just for the Games



Rest of World

- Factors affecting forecast
 - Canada was an easy country to work in
 - Growing interest in Olympics
 - HD – higher bandwidth
 - Multiple distribution
 - Specialty channels/cable channels
 - New media – Cell Phones, Internet
 - Demand for more “live” coverage

The numbers between games is going up, varies wildly and is technology dependant

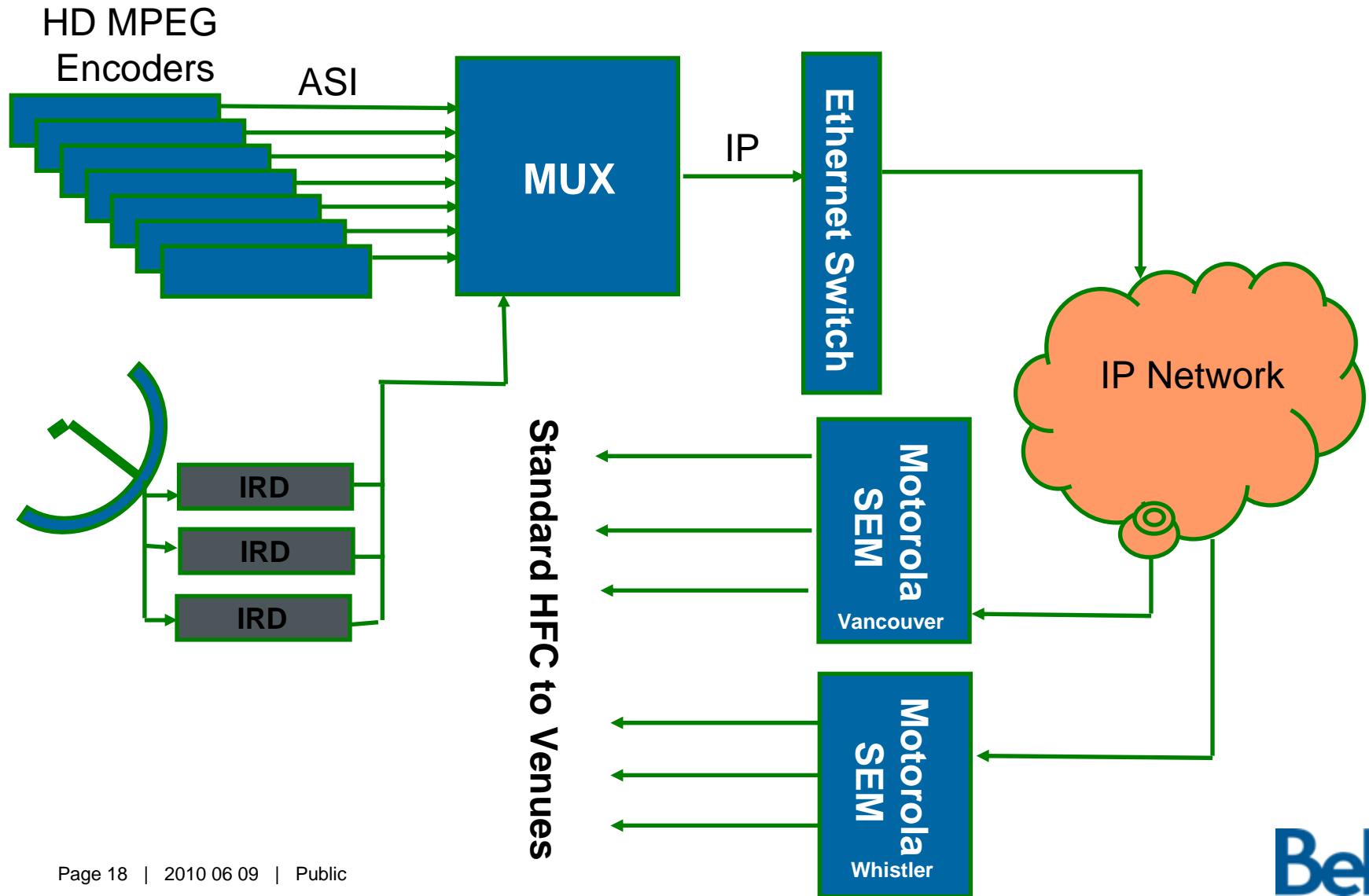
CATV

- Yes we can do this on IP, but should we?
 - IPTV
 - Single cabling infrastructure
 - No additional fibre to the Venues
 - HD Video must be MPEG encoded, so latency is not an issue on Coax vs. Cat5
 - Requires Set top boxes
 - Coax
 - It will work
 - Lots of skills to support it
 - May still require a set top box

Coax vs. IPTV

- Panasonic TV's were standards compliant for MPEG on Coax - No set top box required.
- The cost of the Coax Infrastructure cost almost exactly the same as buying 3000 set top boxes.
- Back to flawless
 - Coax was easily understood, readily available, and easy to support.
 - IPTV was new. Would require lab time to verify the solution and would add complexity and load on the network.

CATV Design



The IBC and MPC

- The new Vancouver Convention Centre opened in April 2009 as the most technologically advanced building of its kind in the world. The Telecom infrastructure was a key factor in supporting the needs of our Olympic Broadcasters and Media



What is in store for the future

- Large Bandwidth IP.
 - bypassed the Video Rate card for Vanda's
- 3D –TV
 - How many years and how much bandwidth
- Audio
 - ISDN dead or alive?.



