

TVBEUROPE



CMP
United Business Media

Europe's television technology business magazine

NOVEMBER 2007 £5.00/€8.00/\$10.00

First time a European PSB ran own management of developing installation

What happened at DR?

The idea behind DR BYEN was to build an all-digital tapeless facility that would be HD-capable and networked to support editing, graphics and production. A high-level target was set and the current status of that target at the end of 2007 is: not fulfilled and still under development. Objectives such as tapeless and HD capability have not yet been reached. Following its first year of official playout and production operation, Reinhard Wagner took a close look at the long DR BYEN story

In 2004 PSB Danish Broadcasting Corporation (DR) hit the headlines with the news that it was building a new headquarters in Copenhagen, called DR BYEN, which would house all units that were at that time spread out over Copenhagen and its suburbs. DR produces and broadcasts two TV, four radio and 17 DAB channels. Together with its online activities (on-demand and streaming), an additional four multiplexed DTT

channels and 35 internet channels and mobile media are transmitted.

Back in June 1999 the initial decision was made to centralise all facilities (12 production units) into one big building complex. When Danmarks Radio made this decision, the idea behind it was to streamline production, workflow and manpower.

DR engineers and production personnel brainstormed and visited exhibitions and broadcast facilities to find the best software and hardware solutions to fulfil their needs. After writing down their basic requirements and outlining the workflow that should be part of the new installation, they bought their first choice hardware and software.

In 2000, 16 pan-European tenders were released (current status: 36 tenders) to find system integrators and sub-contractors to build the facilities with the chosen equipment. Danmarks Radio decided to be its own general contractor and to work with sub-



The news from Copenhagen: Danmarks Radio decided to be its own general contractor and hire sub-contractors and SIs during the entire implementation process



Master control: Total investment has reached approximately €120 million, involving increasing complexity, time delays in construction and additional tenders

contractors and system integrators during the entire construction and implementation process.

Companies such as Studer, Snell & Wilcox, Harris, Pro-Bel, Lawo, Avid, Silex Media, BFE, MCI Hamburg and Broadcast Solutions were granted work within the project.

In November 2002, the construction of the centralised head-

quarters and production complex with its four segments — Studio and Production, News and editorial offices, administration, and finally a concert hall — got underway.

In 2004 the integration of the technical infrastructure together with hardware and software started

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News light at TF1

By Fergal Ringrose

France's leading commercial TV station, TF1, has broken with television lighting tradition by making its recently redesigned main news studio the world's first studio of this kind to be lit almost entirely by silent, fanless fully automated profile spotlights.

TF1 chose the WARP/M, the ADB motorised profile, as its primary lighting source for the brand new set of this studio, which is the hub of F1's three-times-a-

day comprehensive news bulletins. The studio also produces weather reports, in-depth economics reports and documentaries.

TF1's Lighting Director Jean-Bernard Favero-Longo and Technical Director Jean-Pascal Lefort decided not to use conventional TV studio lighting equipment in the new design. Instead they created a bold new look that exploits the versatility provided by automated lighting.

The TF1 technical team required fanless, silent operation,



The TF1 technical team required fanless, silent operation and precise repositioning

very precise repositioning between movements, and high light output with low power requirement. The

WARP/M's cool, high-efficiency beam output of 1733 lux at 12° and 15m is designed to match the light

output of a standard 1,200W profile while consuming 800W of mains power, and its three-phase stepper motors and fanless cooling provide silent operation.

The WARP/M rig allows TF1's lighting director to instantly adapt the look of the studio to a number of pre-programmed configurations. Precise repositioning then allows switching back to an earlier state with no variation. The latest version of the WARP/M's software eliminates the need to reset any parameter of the luminaire — after a power down for example — thus eliminating a potential source of noise.

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What happened at DR?

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— final decisions having been reached following four years of planning and system-finding processes. These system-finding processes involved massive consultation amongst manufacturers, because some tenders had not been finalised but instead contained only vague descriptions of final status.

The bottom line

For the very first time, a European public service broadcaster had decided to run the general management of the developing site with its own personnel — planned, monitored, controlled and executed under control and management of DR. All contracts contained paragraphs that forced sub-contractors to work in close cooperation with other contractors, because of the fact that DR acted as general contractor itself.

DR defined in its tenders that sub-contractors had to implement and configure for seamless workflow all equipment that DR pre-purchased. Contractors also had to secure a seamless migration from legacy studios into a new, all-digital broadcasting facility.

Total investment has reached approximately €120 million, involving increasing complexity, time delays in construction and additional tenders — a huge amount for a PSB which does not broadcast any advertising and is only funded by viewer licence fees. However, subsidies from the government are also received.

This massive figure has not only led to several rounds of refinancing but also caused the resignation of two top managers — the director general and one of the members of the executive board. However, executives at DR are still confident that the money they have invested (and still have to) is good value and has been invested properly.

Building facilities

The original concept of an all-digital infrastructure with MAM and CMS (coupled to automation and nonlinear workflow) had to be rethought, because of interfacing difficulties with software and hardware. Although they depended on sophisticated equipment with future-proof technology (manufacturer jargon), DR had to face the fact that what they got was somewhat different to what they were told they would get.

Networking for example, and the idea behind it, had to be realised by contracting an IT partner to build a fully redundant dual-ring fibre-optic infrastructure that can handle data rates up to 1.5Gbps. The two-ring physical network does have an undefined number of logical layers that represent the whole networking infrastructure.

Learning process

Harsh reality revealed that the IT guys do not understand realtime broadcasting. The QoS they delivered does not fulfil broadcasting requirements — a lesson not only learned by DR but also by other European broadcasters such as BBC, BR and WDR as well.

Poul Norgaard, project manager, Technology Project Decentral Production Facilities, said, "You never get what you've been told you'll get! IT does not fulfil our realtime requirements. That is one of the reasons why we are still using legacy devices such as VTRs. IT people do not understand broadcasting! There is still a learning process in progress, and time will show how we succeed."

Other areas, such as CMS and automation in conjunction with run-downs and news operations, brought up problems and modules within the software solution had to be replaced

by Pro-Bel Morpheus. Other implementations such as the audio routing (Lawo), intercom from Riedel, integration of the Studer On-Air 3000 consoles, networked editing in conjunction with Avid Isis and central storage/archiving solutions from SGI/Silex Media went well. The Lawos connected to the Studers, Pro-Bel with Omneon, and control solutions from Broadcast Solutions interfaced with almost all third-party devices.

All the integrators worked closely together, trouble-shooting problems without looking for a scapegoat because DR forced all engineers (and there have been sometimes been 400) to work as 'one party' otherwise they wouldn't receive payments for finished segments of the project. Only when there has been a 100% agreement on integration has payment been processed by accounting.

"Whatever amount of money you are estimating to invest into an IT project, just double it and then multiply it by 10 to get its final total. That equals approximately to what DR invested at DR BYEN," said Poul Norgaard.

An Avid Isis SAN and ingest client solutions from Ardeno have been integrated out of the News & Sports project that had been finalised prior to the all-digital project. Monitoring was supposed to run on TFT displays but operators insisted on getting their old CRTs back because of unacceptable AV delays experienced while performing edits.

The design concept does not look at a central machinery area. Local machinery sections interconnected by fibre optics have been installed instead. This is intended to provide broadcast operations when other areas might be out of order. News operations are sealed off from other areas by key code access control, operating absolutely independent with 20 Mojo editing systems. The MCR is used for monitoring cross-media operations of DR. Channel production is integrated as well as radio operations (not on-air yet) and all lines are controlled and monitored.

Content sharing

A data-based production and archive system that uses media management via Hydrogen was designed and integrated by Silex Media. Approximately 280 NLEs have parallel access to it and collaborate over a single file format — a descriptive container with four audio files and video DIF blocks defined in SMPTE 374M/375M/376M. The near-line archive provides 170,000 hours (at 23Mbps) of mirrored capacity (4.3PB) on Cym servers.

The video section uses 70,000 hours with DVCPRO25 and DVCPRO50 material. The rest is held in reserve. All data exchange is handled by the Hydrogen HLM systems from Silex Media over — when required — third-party hardware. Over 300 browse editing clients, seven studios, and a WAN interconnection can request access and share the common database, which is fed by 30 tape-ingest and 24 automated feed-ingest stations.

Because of development delays and the fact that the old production facilities had to be evacuated, the production operation moved into the new facilities even though the building process was still in progress. The complex was handed over to operations in small blocks, and evaluated with final acceptance tests by so-called multipliers. These people forwarded their experience and knowledge to the operational personnel. Delays have been multifarious because of problems with integration and interfacing, which led to reprogramming of IFs and new MADI interconnections.

At the time of writing the commissioning tests were still running, even though the facilities have officially been on-air since January 2007. It would appear that such a huge IT-based project never comes to an end.