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ABSTRACT

This paper details typical construction errors that occurred during the building of new media laboratories at the University of Missouri at Kansas City. Also defined are the steps and guidelines that need to be taken to protect specialized media facility designs and specifications from compromise or deletion by general project architects, engineers, and contractors. (GR)

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Trust No One: Protecting your new media facility construction from architectural and engineering SNAFUS

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Presented at AMTEC 1999, Ottawa, Ontario, Canada

This case study details typical construction errors that occurred during the building of new media laboratories at the University of Missouri at Kansas City. Our experiences have all too frequently been shared other educational institutions. This presentation defines steps and guidelines that need to be taken to protect specialized media facility designs and specifications developed by knowledgeable technical staff and consultants from compromise or deletion by general project architects, engineers, and contractors.

YOU ARE IN TROUBLE WHEN:

1. Your media facility construction is part of a larger, more generalized project.
   - Architects are more likely to be general rather than specialized.
   - Purely media production oriented institutions design their own facilities and contract for specific out-sources. (In broadcasting, the chief engineer is the client approval/ project manager functionary.) Multi-role institutions are generalized and therefore rely more on the architectural/engineering firms for design and code compliance, and your client /project manager will be unspecialized.

2. Your media facility is a building renovation rather than a new construction.
   - The older the building the more hidden surprises (undocumented structural elements) and the higher the cost to conform to current codes and designs. Such obstacles will result in cost over-runs and pressure to recoup by deleting special project features.

3. Your complete media specifications regarding HVAC, utilities, floor and wall restrictions, etc. are not included in project bid specifications.
   - HVAC and AC requirements regarding sound levels, capacity, control, and isolation are exceptional and therefore abnormally expensive to provide and construct. Architectural/engineering firms will be reluctant to absorb these costs after the bid has been won. Your institution will be reluctant to add-in these costs.

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4. The architectural/engineering firm needs to add consultants.

- Consultant's recommendations are only recommendations and may not be adopted by the architectural/engineering firm.
- Architectural/engineering firm will have insufficient practical working experience in designing and accommodating specialized media technology. Crucial elements may be undervalued and trivialized. ("Our understanding was that this studio was to be educational in nature and therefore did not have to meet professional standards".) (UMKC's HVAC location errors, rack AC loss, AC breaker loss, cable run loss, studio storage loss, mic lines loss, hard cyc loss, compromised egresses).
- Retain any consultants of your own you intend to use immediately and require their participation and inclusion from the outset.

5. You or your media experts have no signature over plan approvals or change orders.

- Actual home institution approvals likely reside only in the Director of Facilities, Project Manager, or other non-media facilities management. They may trivialize your requirements and sacrifice them to meet cost or construction deadlines. (How UMKC's project "came in under budget!")
- This is the most critical "empowerment" you can get and is the most unlikely to be given to you. It undermines the authority of those above you. It will slow down the project and demand more time from other participants (so why should they cut you in?) Build a case for such an active (and burdensome) participation.

6. You or your media experts do not get to review actual preliminary and final architectural/ engineering "blueprints" (site plans) as part of your formal approval and oversight.

- "Blueprints" are <u>not</u> artist's renderings or small scale layouts! They are what will be. Renderings and "for approval" small scale floorplan layouts are not built from. Features appearing in renderings and floorplan layouts may not be in the blueprints! (UMKC's missing hard cyc wall, rack AC outlets, cable conduits, etc.)
- Hire your own consulting architect or engineer (a student might do) to interpret symbols. Blueprints are extremely complex and difficult for laypersons to interpret. It's like trying to recognize someone you know by looking at X-rays.

7. You or your designee do not make or participate in final decisions resolving discrepancies in plans that are discovered during construction.

- These discrepancies always occur.
- Participation requires an on-call availability.

8. You do not receive minutes of all meetings held involving your facility.

- Save all minutes and notes. Record off all voice-mail. Save everything for you will need it!
- Clarify and expand on all recorded details and specifications with follow-up memos.
- Sorry, but some architects lie about what was or was not agreed upon (UMKC's hard cyc as "furniture", AC outlets, cable runs, etc.) so be prepared to document your case.

9. You do not have direct communication privileges with the architects.

   - Lack of direct access means information and action delays, plus errors.

10. Architects and engineers invoke Manufacturer's Recommendations.

    - UMKC's film chain working access and dimmer rack location conflicts.
    - All manufacturer's recommendations must be weighed against real-world experiences and needs and must be over-ridden as justified.
    - New specification scales to convert to/from (eg. slow-response A and fast-response B weighted SPL Db, NC levels, etc.)
    - The architect/engineer's CYA!
    - Codes, specifications, and recommendations can have very little to do with functionality (and can even be dangerously dysfunctional, e.g. UMKC's radio lab access ramp).

11. When form follows "features" rather than function.

    - Interior decoration and "design features" can have very little to do with functionality (and can be ergonomically dysfunctional, e.g. lab lighting, room access, film projection for lecture halls, etc.)
    - Materials and fixtures appropriate for general space use may be inappropriate or even disruptive for specialized media facility use. Architects will try to keep costs low by using standardized general use materials and fixtures in all areas. "Custom" items (e.g. 5400 degree Kelvin lighting in computer graphics labs) will be expensive and take more time to design, order, and install.

WHAT HAPPENED AT UMKC:

• Studio storage space for cameras, sets, and props was deleted without our consultation. All of our equipment will now have to be kept out on the studio floor, underfoot. This means that only about half of the studio floorspace can be used as shooting areas.

• Air conditioner was located beneath TV control room floor and so is a source of constant air noise and vibration. Sound barriers in ductwork were provided for studio and audio control room, but not for television control room.

• Exposed AC ductwork air control valves in studio produce noise that can be picked up by microphones in the studio.

• Specified underfloor cable run and access space was not provided in control rooms. Cables now have to be strung up and over through ceilings, adding to required lengths and obstructing access for repair or modifications.

• Studio doors at ground level are too narrow for camera pedestals and jib arm to pass through. Pedestals need to be carried (by six persons) up stairs if they are needed outside the studio.

• Complete film chain could not be installed because architect did not allow floorspace for operator access. Architect claimed that manufacturer's recommendations were followed; they were in regards to clearances needed to open panels on the equipment. Manufacturer did not consider it necessary to specify a standing space allowance for human operators. Apparently, it is necessary, since architect continued to insist he was within specifications. We had to abandon the film chain.

• Unapproved ductwork in control room walls removed 18 square feet of floorspace and eliminated straight-in access into control room. Consequently, seven foot high equipment racks can no longer be moved in or out of control room.

• Passageway for cables in control room was punctured by drywall nails all throughout length, snagging cables.

• Dimmer rack was located in television directing control room against manufacturer's warning: "Fan and filter choke noise emissions at some levels may be objectionable so racks should be installed away from...occupied areas". There is now constant dimmer fan noise in this "occupied area" which conflicts with program audio, making quality control of program audio by the television director difficult. Architect claims noise level is acceptable for control rooms as per specifications for library use areas.

Heat and electromagnetic interference output may also become disruptive. Both consulting video engineers Robert Gallo of Psionics, Inc. and David Deleersnyder of IVN confirmed that these dimmers are likely to be a source of electromagnetic interference that will disrupt our video and audio signals.

• Equipment racks in media editing room were specified to have 20 amp power for each rack (total of six). Only <u>one</u> wall outlet was installed in the equipment rack area, so no power was provided for these racks. Architect claimed he was never informed of rack number or location, but this claim was proven false by his own records.

• Local breaker panels for labs were specified and are missing. Consequently, on-off power control of rack systems is missing. A single master panel in a remote, locked area controls all circuits for these labs and the studio. Architect has suggested using plug-strips.

• No cable pass-throughs between editing and TV control labs for connecting equipment together were provided. Architect claimed he never got the information on this but his records show otherwise. We had to cut our own pass-throughs.

• Specified cable pass-throughs between editing room and engineering office were not made. This compromises computer equipment (CPU) protection.

• Specified hard cyclorama wall (Pro-Cyc) for southwest corner of studio was missing. We cannot do basic chromakey video image layering effects of practical, viable scale without this wall. This greatly limits our potential for both teaching students contemporary production methods and attracting outside revenue clients. Architect said this was deleted because it is a "movable furniture item". It is eleven feet high, 22 feet long, and weighs 448 pounds, which does not match our definition of "movable furniture item".

• Specified microphone wall jacks for studio (eight total) were missing. Where do we plug in our microphones? Architects said they were not responsible for audio recording equipment installation.

• Specified leveling slab for TV studio was not provided. The studio floor is unfinished slab sections with uneven surfaces and seams. It will be impossible to do smooth moving camera shots in the studio, a standard production technique. Architect said the leveling slab would've raised the floor too high for handicapped access.

WHAT HAPPENED AT UMKC HAPPENS ELSEWHERE!

After all our tribulations it was understandable to believe that we had been simply cursed with the Director of Facilities and Architects from Hell. After all, our Director of Facilities was removed from his position and, since he was tenured faculty, "returned to his first love, the classroom" for his part in approving the many deletions and omissions noted above. The architect is being pursued for redress on specific issues. Surely, ours was an extreme and abominably awful case! But this is apparently <u>not</u> the case. In our commiseration and sympathy-seeking among colleagues at other institutions we have been surprised to find that our experiences are not unique and isolated.

The preceding eleven "trouble" points can essentially be reduced to two major recommendations: put the media experts in the highest possible position

of approval and oversight possible, and have all technical requirements specified, including "non-media" elements such as HVAC, sound, egress, general lighting, etc., as soon as possible (before any solicitation of bids).

Through both professional experience and contact with other professionals most media managers and producers know what attributes their facility should have. Basic guidelines such as "put AC units far away and make sure they will be in operation all-year and under your control" and "use sound absorbing surfaces in all areas with mics" and "hang lighting grids to provide 45 degree or shallower throws" are common knowledge and common sense. The real trial is not in researching, accumulating, and defining such requirements but in maintaining the "data integrity" of your input through to the final embodiment.

Too often the requirements of rank and file institutional constituents are considered "wish lists" of a cosmetic or ergonomic nature and of a lower priority than engineering, building code, and structural requirements. It is this relegation of media production requirements to the level of non-essential features that leads to their easy dismissal. Compromising media production capabilities is considered a lesser evil than compromising construction, budget, or completion deadlines.

The informed advocate for maintaining media facility requirements must be an effective advocate, and this can only be obtained when that advocate in a position to review all stages of the project, argue for additional funds and/or time as needed to meet facility requirements, and withhold approval at all stages of the project until satisfied. This, however, is an extremely powerful position to be in, even if only for the life of the construction project, and is rarely assigned to media managers within non-media related institutions.

Requesting such project oversight authority is not likely to be an easy task, but this depends tremendously on the relationships that already exist between the media expert and the higher administration. Do you have lunch once a month with

the University President? Play golf with the Director of Facilities? If not, you may need to find an intermediary who can secure you an audience.

One approach to justifying such oversight is to research both successful and unsuccessful projects in order to illustrate the consequences of inclusion or exclusion of the media expert and the degree of significant oversight. Horror stories (such as UMKC's) can serve as effective cautionary examples of what can result if there is insufficient oversight, and may make the case for you better than a litany of success stories. We learn best from mistakes. Show that you are needed to "keep it from happening here".

Much will also depend on how well the media expert establishes and communicates their competency and entitlement to such oversight privileges. Unfortunately, "the prophet has no honor in his own country", which is why it is so often necessary to bring in an outside consultant to essentially argue the same case that the indigenous expert has already built. Therefore, bringing in an external prestigious superstar is often a necessary (but often a superfluous and expensive) step in enhancing the legitimacy and priorities of the media facility's design and construction specifications.

Control over <u>all</u> aspects of the project (including floor coverings!) and control as soon as possible is the best guarantee that "SNAFUs" will not occur. The vigilance must be constant and global in scope and the authority must be decisive. However, this level of control and oversight will not be a part-time commitment. Whoever assumes this responsibility will have little time left for customary activities, and those who have granted this level of oversight will have little patience with delays in reviews/approvals of the many revisions to site plans that will occur in the normal lifespan of a construction project. Acting as a project manager will be a full-time job.

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