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Following is an outline of a paper presented at the NFPA World Safety Conference held in Boston on June 3-7, 2007. The paper was written by Jane Schauer and Cyril McIvor, both directors of Dysen Pty Ltd.

A SWOT Analysis of Current Fire Protection Engineering in Australia 2007

- S: Strengths
- W: Weaknesses
- O: Opportunities
- T: Threats

Qualitative research based on the experience of Cyril McIvor.

Analysis covers:

- standards
- design process
- materials
- human factors

STRENGTHS

Australian standards generally give a higher level of protection than many international standards.

- Up to 4 hours fire rating for warehousing & 3 hours for shopping centres.

Excellent design innovation.

- For example underground power stations in National Park use water mist instead of water to manage transformer oil fires.

Innovative use of materials for greater efficiencies.

- For example reinforced concrete used widely in building construction, less use of steel than in many countries.

Generally a good work ethic in the building industry.

- Usually a desire to give good service, try new things, willingness to work long hours.

WEAKNESSES

Standards often behind developing technology because they aren't reviewed regularly enough –typically reviewed every 10 yrs or more.

- For example maintenance regime doesn't allow for automatic checks by technology built into equipment.

To save costs multi-service consultants often use available but less than adequately qualified designers for a specific job.

- For example the use of electrical engineers to design fire detection systems, because the engineers have electrical competency.

Projects usually fail to employ a fire integrity consultant to oversee construction methods.

- As a result services penetrations normally undermine fire barriers & have to be rectified.

Many projects fail to employ a fire engineer early enough.

- The engineer is often employed once problems occur, but it can be too late for an economical solution.

Added inefficiencies & costs associated with materials being imported due to inadequate Aust. manufacturing base.

- For example to get local standards approval there is usually an expensive need for more rigorous testing. Also, a number of overseas products fail the testing even though they would be adequate for a job.

Overall shortage of skilled staff leads to project time delays & problems (including threats to safety) caused by using insufficiently skilled staff.

- Insufficient accreditation schemes encourage use of insufficiently skilled people. Also, accreditation differs between states.

Significant variations between certifiers who can be too harsh, or too lenient, because of lack of knowledge of elements being certified.

- New private certification scheme offers scope to pick certifiers who are known to be more lenient.

Australian states use different certification criteria.

- For example the following variations in regards to peer review of the fire engineering design:
  - → to be done by the Fire Brigade
  - → to be done by an accredited fire engineer
  - → not required

Since the 80's a detrimental change in the architects role.

- For example architects role as senior manager of project usurped by professional project managers, who lack the same level of integrated design skills.

Inefficiencies because architects lost detailed knowledge of fire safety & services requirements (important area that takes up about 35% of building code).

- As a result architects original building design can be problematic & lead to costly need for later modifications.

OPPORTUNITIES

More frequent reviews of standards would enable greater technological & design efficiencies.

Greater use of ISO manufacturing standards would allow cheaper production of materials with world market & prevent time wasting associated with duplication of standards.

When standards are created or reviewed there is an opportunity to orient them towards innovative rather than prescriptive designs.

- This could facilitate better performance & efficiencies.

Greater efficiencies could be gained by designers, or others, coming up with alternative use for materials.

Greater efficiencies could be gained by more computerization of the design process.

- An example is the current benefits gained by the integration of Autocad with calculation & fabrication.

Creation of an accessible register of available products/materials & their performance testing results eg UL listing.

- Currently it's not easy to find what is available & many manufacturers are reluctant to supply technical details of testing.

The skills shortage could be addressed by skills importation from overseas with necessary bridging training & familiarisation.

The skills shortage could be addressed locally by promoting better awareness of & interest in fire engineering careers & then more training courses.

- There is also an opportunity to improve skill levels by improving teaching abilities of industry staff who are used as trainers.

The creation of a national accreditation scheme would enable admin cost savings & greater portability of accreditation.

- The creation of more levels within the scheme would ensure sufficient skills to do task required.

In trades training there could be a greater incorporation of how the work of various trades needs to be integrated in construction, including how various materials should be used correctly together.

- This would lead to a trade doing their work in a way that causes less problems to the next trade.

THREATS

Standards organisation not updating with sufficient timeliness (max 3-5yrs needed).

Threat that the standard creation & updating process could be highjacked by self interested committee members, if other members weak.

- For example a major fire protection company being able to get a standard written to suit their product.

Significant threat of an increase in consultancy mediocrity caused by consultants saving costs by issuing standard specifications that have not been reworded to meet particular project requirements.

A significant increase in the cost of steel would lead to cost overruns (but could also lead to innovative design).

The general skills shortage is a threat to the economic efficiency of Australia.

- In regard to fire protection the continuing skills shortage would lead to time delays, increase in expenses, defective building practices & threats to safety.

KEY POINTS

	Standards	Design Process	Materials	Human Factors
S	High level of protection	Excellent	Innovative use	Good work ethic
W	Behind in technological development	Designers lacking knowledge Poor timeliness & appropriateness of consultants employed	Inefficiencies with imported materials	Shortage of skilled staff Certification variations
O	More frequent review Orient more towards innovation	Alternative use for materials Greater computerization	Register of products & their performance testing results	Import skills Better training system
T	Untimely updating Creation process high-jacked	Consultancy mediocrity	Increase in steel price	On-going skills shortage