

5.5 SUMMARY

The FSI added little to the overall uncertainty in the simulation of the temperatures at the outer surfaces of bare steel elements and the surfaces of SFRM and, more importantly, at the SFRM-steel interface. On the average, the numerical predictions of the steel surface temperature were within 7 percent of the experimental measurements for bare steel elements and within 17 percent for the insulated steel elements. The former was determined to result from uncertainty in the heat release rate in the fire model. The increase in the latter was attributed to model sensitivity to the SFRM coating thickness and thermal conductivity.

Even modest application of insulation to the heavier steel provided significant thermal protection for exposure durations longer than the duration of the fires in the WTC on September 11. For thinner steel, the presence of gaps and high thickness variation in the applied insulation can lead to problematic heating rates of the steel.

5.6 REFERENCES

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