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Introduction and methodology

Objective
This study was completed by Consulting-Specifying Engineer to evaluate the use of fire and life safety products and systems by consulting engineers. By gathering data about the dollar amounts of fire and life safety systems specified, the types of fire and life safety products selected, and the challenges that fire and life safety system designers face, Consulting-Specifying Engineer provides a snapshot of the engineering community’s outlook on fire and life safety products.

Sample
The sample was selected from recipients of Consulting-Specifying Engineer for whom e-mail addresses were available. Only respondents involved in the buying/specifying process for fire and life safety products and services were asked topic-related questions.

Method
Subscribers were sent an e-mail asking them to participate in this study. The e-mail included a URL linked to the questionnaire.

- **Data collected**: December 11, 2015, through January 13, 2016
- Respondents were asked questions on fire and life safety products specified and details about specifying these products. Participants also provided information about familiarity with fire and life safety manufacturers.
- **Number of respondents**: 257
  - Margin of error: +/- 6.1% at a 95% confidence level
- **Incentive**: Survey participants were offered the opportunity to enter a drawing for a $50 VISA gift card.
Summary of key findings

Respondents to the Consulting-Specifying Engineer 2016 Fire and Life Safety Study identified eight important high-level findings impacting the fire and life safety industry today:

1. **Building structures:** The top building structures respondents specify, design, or make fire and life safety system product selections for are office buildings (75%), industrial/manufacturing facilities/warehouses (56%), government buildings/military facilities (49%), and college/university buildings (49%).

2. **Involvement:** Eight in 10 respondents determine requirements/write specifications for fire and life safety systems.

3. **Systems specified:** Three-quarters of respondents specify or expect to specify detection products—including control systems, dampers, and fire, smoke, heat, and linear detectors.

4. **Systems value:** The average total annual dollar amount of fire and life safety systems specified for new and existing systems is $2.2 million.

5. **Challenges:** When asked about the challenges to fire and life safety system design and specifications, six in 10 respondents indicated subjective interpretation of regulations by code authorities, inadequate design budget, designing for interoperability and integration of systems, codes and standards, and education as constant hurdles.

6. **Disciplines:** Local AHJs or fire officials have the most input and impact on fire and life safety design, according to 72% of respondents, followed by owners (43%), architects (40%), and the electrical engineer (38%).

7. **Design factors:** Product quality (70%), service support (47%), and manufacturer’s reputation (42%) were identified as extremely important to respondents when selecting fire and life safety systems.

8. **Experience:** The average engineer involved in fire and life safety systems has been in the industry for 23 years.
Respondent profile
Six in 10 respondents have been involved in fire and life safety systems for 20 years or more. All ages are represented within this report, with the average respondent being 55 years old.

**Experience with fire, life safety systems**
- 5 to 9, 12%
- 10 to 19, 23%
- 20 to 29, 25%
- 30 or more, 35%

**Average 23 years**

**Current age**
- 30 or younger, 4%
- 31 to 40, 10%
- 41 to 50, 15%
- 51 to 60, 31%
- 61 or older, 38%

**Prefer not to say**, 2%

**Average 55 years old**

Q: For approximately how many years have you worked in fire and life safety systems? (n=257); Q: Which of the following ranges includes your current age? (n=257)
Respondent selection roles

Thirty-seven percent of respondents reported their primary job function as professional engineer, while 79% are responsible for determining requirements and/or writing specifications for fire and life safety systems.

**Primary job function**

- Engineer: 37%
- Engineering management: 32%
- Senior administration: 27%
- Other: 4%

**Selection involvement**

<table>
<thead>
<tr>
<th>Selection involvement</th>
<th>0%</th>
<th>20%</th>
<th>40%</th>
<th>60%</th>
<th>80%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine requirements/write specifications</td>
<td></td>
<td></td>
<td></td>
<td>79%</td>
<td></td>
</tr>
<tr>
<td>Research and evaluate options</td>
<td></td>
<td></td>
<td></td>
<td>64%</td>
<td></td>
</tr>
<tr>
<td>Supervise or consult on project</td>
<td></td>
<td></td>
<td></td>
<td>62%</td>
<td></td>
</tr>
<tr>
<td>Recommend brand</td>
<td></td>
<td></td>
<td></td>
<td>53%</td>
<td></td>
</tr>
<tr>
<td>Select brand</td>
<td></td>
<td></td>
<td></td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td>Approve purchase</td>
<td></td>
<td></td>
<td></td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>Place order</td>
<td></td>
<td></td>
<td></td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>Retrofit systems only</td>
<td></td>
<td></td>
<td></td>
<td>3%</td>
<td></td>
</tr>
</tbody>
</table>

Q: Please indicate your primary job function. (n=257); Q: In what ways, if any, are you involved in the selection of fire and life safety systems? (n=257)
Company profile

Fifty-seven percent of respondents reported their company as a consulting engineering firm, and 59% indicated that their firm employs fewer than 100 people.

Q: Which of the following best describes your company? (n=257); Q: Approximately how many people are employed by your firm? (n=254)

Company type

- Consulting engineering firm: 57%
- In-house engineering: 16%
- Engineering/architectural firm: 7%
- Architectural/engineering firm: 7%
- Design/build firm: 6%
- Construction/contracting firm: 5%
- Other: 2%

No. of employees

- 1 to 19: 37%
- 20 to 99: 22%
- 100 to 499: 18%
- 500 or more: 23%

Average 220 employees

Q: Which of the following best describes your company? (n=257); Q: Approximately how many people are employed by your firm? (n=254)
Twenty-nine percent of respondents are located in the southern region of the U.S., and another 13% are based outside of the U.S. Other countries represented include India and Canada.

Q: In what region of the country are you based? (n=257)
Building structures

Three-quarters of respondent specify, design, or make product selections for office buildings, while 56% work on projects for industrial/manufacturing facilities/warehouses.

Q: For which of the following types of building structures do you specify, design, or make product selections? (n=257)

<table>
<thead>
<tr>
<th>Building Type</th>
<th>0%</th>
<th>20%</th>
<th>40%</th>
<th>60%</th>
<th>80%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office buildings</td>
<td></td>
<td></td>
<td></td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>Industrial/manufacturing facilities/warehouses</td>
<td></td>
<td></td>
<td>56%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government buildings/military facilities</td>
<td></td>
<td></td>
<td>49%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College/university buildings</td>
<td></td>
<td></td>
<td>49%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitals/health care facilities</td>
<td></td>
<td></td>
<td>48%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data centers</td>
<td></td>
<td></td>
<td>44%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineered multi-dwelling/retail complexes/restaurants</td>
<td></td>
<td></td>
<td>42%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K-12 schools</td>
<td></td>
<td></td>
<td>41%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research facilities/laboratories</td>
<td></td>
<td></td>
<td></td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Hotel/motel/resorts</td>
<td></td>
<td></td>
<td></td>
<td>37%</td>
<td></td>
</tr>
<tr>
<td>Parking garages/service stations</td>
<td></td>
<td></td>
<td></td>
<td>36%</td>
<td></td>
</tr>
<tr>
<td>Churches/religious buildings</td>
<td></td>
<td></td>
<td></td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>Utilities/public works/transportation</td>
<td></td>
<td></td>
<td></td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>Sports/entertainment/convention center facilities</td>
<td></td>
<td></td>
<td></td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>Correctional facilities</td>
<td></td>
<td></td>
<td></td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8%</td>
</tr>
</tbody>
</table>
Annual revenue, spending

The average engineering firm generates about $9.2 million in mechanical, electrical, plumbing, and fire protection design revenue; while the average total annual dollar amount of fire and life safety systems specified is $2.2 million.

Q: Which of the following ranges best describes your firm’s annual mechanical, electrical, plumbing, and fire protection design revenue? (n=214);

- Less than $1 million: 33%
- $1 million to $5 million: 22%
- $5,000,001 to $10 million: 16%
- More than $20 million: 19%

Q: What is the total annual dollar amount of fire and life safety systems specified by your firm for new and existing buildings? (n=228);

- Less than $500,000: 32%
- $500,001 to $750,000: 18%
- $750,001 to $1.0 million: 14%
- $1.1 million to $3.0 million: 10%
- $3.1 million to $5.0 million: 8%
- More than $5.0 million: 16%

**Average**

- Total annual MEP design revenue: $9,165,888
- Dollar amount of fire and life safety products specified: $2,177,083

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Q: Which of the following ranges best describes your firm’s annual mechanical, electrical, plumbing, and fire protection design revenue? (n=214);

- Less than $1 million: 33%
- $1 million to $5 million: 22%
- $5,000,001 to $10 million: 16%
- More than $20 million: 19%

Q: What is the total annual dollar amount of fire and life safety systems specified by your firm for new and existing buildings? (n=228);

- Less than $500,000: 32%
- $500,001 to $750,000: 18%
- $750,001 to $1.0 million: 14%
- $1.1 million to $3.0 million: 10%
- $3.1 million to $5.0 million: 8%
- More than $5.0 million: 16%
Specifying fire and life safety systems
The top types of fire and life safety systems specified are fire, smoke, heat, and/or linear detection products (81%) and smoke detection, control systems, and/or dampers (74%).

Q: Based on projects you are currently working on, what types of fire and life safety systems do you expect to specify or select within the next 12 months? (n=257)
Fire and life safety systems specifications

<table>
<thead>
<tr>
<th>Specification Type</th>
<th>Always (%)</th>
<th>Frequently (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>28</td>
<td>52</td>
</tr>
<tr>
<td>Prescriptive</td>
<td>14</td>
<td>51</td>
</tr>
<tr>
<td>Open: proprietary</td>
<td>47</td>
<td>52</td>
</tr>
<tr>
<td>Open: alternate or substitute</td>
<td>43</td>
<td>49</td>
</tr>
<tr>
<td>Closed: single source and alternate</td>
<td>25</td>
<td>29</td>
</tr>
<tr>
<td>Closed: proprietary</td>
<td>22</td>
<td>26</td>
</tr>
</tbody>
</table>

Q: Of the total fire and life safety systems specifications issued by your firm, how often are you using each of the following? (n=250)

Fire and life safety systems specifications—those that state the performance that must be achieved by the completed work—are written by eight in 10 respondents, while 65% generally write prescriptive fire and life safety systems specifications.
Challenges facing engineers

The subjective interpretation of regulations by code authorities and in adequate budgets are critical challenges faced by engineers when specifying fire and life safety systems.

Q: What are critical challenges or issues affecting the future of fire and life safety systems, engineers, and/or the industry? (n=257)
Important design factors

The most important factors to respondents’ selection of fire and life safety systems are product quality (97%), manufacturer’s reputation (91%), service support (86%), and technical advantage of product (85%).

<table>
<thead>
<tr>
<th>Factor</th>
<th>Extremely important</th>
<th>Fairly important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product quality</td>
<td>70%</td>
<td>27%</td>
</tr>
<tr>
<td>Manufacturer’s reputation</td>
<td>42%</td>
<td>49%</td>
</tr>
<tr>
<td>Service support</td>
<td>47%</td>
<td>39%</td>
</tr>
<tr>
<td>Technical advantage of product</td>
<td>31%</td>
<td>54%</td>
</tr>
<tr>
<td>Manufacturer's complete series or system capabilities</td>
<td>38%</td>
<td>45%</td>
</tr>
<tr>
<td>Previous experience with manufacturer</td>
<td>35%</td>
<td>48%</td>
</tr>
<tr>
<td>Interoperability</td>
<td>32%</td>
<td>47%</td>
</tr>
<tr>
<td>Warranty</td>
<td>35%</td>
<td>43%</td>
</tr>
<tr>
<td>Design support</td>
<td>34%</td>
<td>44%</td>
</tr>
<tr>
<td>Initial product cost</td>
<td>23%</td>
<td>54%</td>
</tr>
<tr>
<td>Lifecycle cost</td>
<td>25%</td>
<td>42%</td>
</tr>
<tr>
<td>Lead/delivery time</td>
<td>24%</td>
<td>41%</td>
</tr>
</tbody>
</table>

Q: In your design/specification activity, how important is each of the following factors to your selection of fire and life safety systems over another? (n=257)
Local authorities having jurisdiction (AHJs) or local fire officials have the most input and impact on respondents’ fire and life safety designs, followed by owners, architects, electrical engineers, and mechanical engineers.

Q: Which of the following disciplines have the most input and impact on your fire and life safety design? (n=255)

- Local AHJ or local fire officials: 72%
- Owner: 43%
- Architect: 40%
- Electrical engineer: 38%
- Mechanical engineer: 37%
- Contractors (electrical, HVAC, etc.): 28%
- Facility manager: 28%

Q: Which of the following disciplines have the most input and impact on your fire and life safety design? (n=255)
Average engineer’s time breakdown

When working on a fire and life safety project, the average respondent with the primary job function of “engineer” spends 62% of their time on billable hours, 14% on department overhead, 5% on marketing, 13% on proposals/business development, and 6% on other tasks.

Q: When working on fire and life safety projects, how is your time broken up? (n=247)
Additional resources from Consulting-Specifying Engineer

Thank you for downloading the Consulting-Specifying Engineer 2016 Fire & Life Safety Study. Use the links below to access additional information on fire and life safety news, products, and research.

Fire and life safety news, articles, and products

- Automation, controls
- Codes and standards
- Emergency, standby, backup power
- Mass notification, emergency communication systems
- Plumbing, piping
- Suppression systems
- New products

Editorial research studies

- 2015 HVAC & Building Automation Systems
- 2015 Lighting & Lighting Controls
- 2015 Electrical & Power
- 2015 Fire & Life Safety
- Additional studies available at: www.csemag.com/research

Other resources

- Fire & Life Safety e-newsletter
- Codes & Standards e-newsletter
- Videos
- Case studies
- Webcasts

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