1) PROPOSED PROJECT TITLE:

Powered Rescue Tool Capabilities: Assessment of Current and Future Use of High-Strength Metal Alloys and Composite Materials

2) PROBLEM STATEMENT (ONE OR TWO SENTENCES ADDRESSING "WHAT IS THE PROBLEM?"):

Powered rescue tools used by emergency first responders are designed and tested according to the minimum specifications of NFPA 1936. Recent years have seen the proliferation of high-strength metal alloys that are resistant to the powered rescue tools that are in widespread common use. This issue is becoming especially problematic with the recent popular use of these metals in the latest models of motor vehicles. An example is the new electric vehicle Chevrolet Volt, cut up at FRI (IAFC Annual Meeting) in Chicago during a demonstration, which was indicated as being approximately 80% high-strength metal alloys requiring powered rescue tools with a higher level of performance. Other transportation applications requiring extrication such as aircraft and rail transport should also be considered.

3) RESEARCH OBJECTIVE (ONE OR TWO SENTENCES ADDRESSING "HOW WILL THE PROBLEM BE SOLVED?"):

Identify and provide an assessment of current and future extrication scenarios, especially those involving motor vehicles, which use high-strength metal alloys and composite materials (carbon fiber) that are resistant to the performance of the present generation of powered rescue tools.

4) PROJECT DESCRIPTION (ONE OR TWO PARAGRAPHS ON STUDY DESIGN & TASKS, E.G. LITERATURE REVIEW, COMPUTER MODELING, HAZARD ANALYSIS, LOSS SUMMARY, CODE COMPARISON, FIELD USAGE SURVEY, ETC…):

The tasks of this project are:

- Provide a literature review of this topic, including performance characteristics of powered rescue tools and the types of high-strength metal alloys that are resistant to traditional powered rescue tools.
- Collect and analyze readily available case study information with known tool performance problems.
- Identify, prioritize and provide an inventory of the motor vehicles (and other common applications as applicable) that are using high-strength metal alloys resistant to traditional powered rescue tools.
- Identify, analyze, and recommend test methods needed to ensure that future generations of powered rescue tools will work by taking into consideration the thickness, shape, and layering or laminating of materials used.
- Provide an analysis of the auto market (and other common applications as applicable) that clarifies the anticipated trends on the use of high-strength metal alloys.

5) RELEVANT NFPA DOCUMENT(S) & HOW PROJECT WILL IMPACT THEM:

NFPA 1936, Standard on Powered Rescue Tools (2010 edition) This research will aid the committee with updating design, performance, testing, and product conformance verification criteria for powered rescue tools utilized by emergency responders with relation to the increased use of high strength steels and composites in the automotive and transportation industry.

NFPA 1670, Standard on operations and Training for Technical Search and Rescue Incidents – Aid the committee in identifying proper and effective use of powered rescue tools when dealing with vehicle extrication as a result of the use of alloys and composites.

NFPA 610, Guide for Emergency and Safety Operations at Motorsports Venues – Increased performance capabilities of powered rescue tools will enable advancement of extrication techniques in racing vehicles.

NFPA 402, Guide for Aircraft Rescue and Fire Fighting Operations – Increased performance capabilities of powered rescue tools will enable advancement of extrication techniques as they apply to aircraft.

6) OTHER ORGANIZATIONS THAT COULD POSSIBLY FUND, IF ANY:

Power tool suppliers, DHS/FEMA fire grant

7) WHEN DO YOU NEED PROJECT DELIVERABLES (ESTIMATED TIMEFRAME FOR COMPLETION, SENSE OF URGENCY):

NFPA 1936 is presently in the Fall 2014 revision cycle

8) SUBMITTED BY (STAFF LIAISON/TC CHAIR/ETC) AND DATE SUBMITTED:

Lew Austin (NFPA 1936 TC Chair) and Ryan Depew (NFPA 1936 Staff Liaison)