September 10, 2014 Meeting

The September 10, 2014 Waterloo Technical Society (WTS) meeting was called to order by President Gary Dorhout at 7:15 pm.

A total of 33 were in attendance. Treasurer Ken Friend reported a previous balance of $956.08. Receipts included $0.35, three months' interest, Mr. David Greene donation of $100 for the Grout Museum Patent Exhibit and $10 in membership dues. Expenses were $15 for the May guest speaker's meal and $300 in contribution to the Grout Museum's Patent Exhibit. The ending balance was $751.43. Mr. Friend received a nice letter from the Grout Museum thanking WTS for its support. Also, Mr. Friend reported a sign at the Grout recognized WTS's support of the exhibit.

No old business was discussed.

No new business was discussed.

Our guest speaker was Fire Chief John Schilling, EFO, of the Cedar Falls Fire Department. His topic was Technology and Horsepower of Fire Fighting.

History. The earliest firefighters were the Romans. The water was supplied by the aqueducts which used gravity to generate water pressure. This was not too effective. There was no fire fighting in ancient Rome until Augustus's era (27 BC to 14 AD). In the United States, Benjamin Franklin formed the first fire protection agency (Union Fire Company, 1736), the first volunteer fire company in the US. It was run like an insurance company. Members paid a premium for protection in case of a fire.

The term "fire plug" used for fire hydrants has its origin in the early US history. Water mains were square wooden troughs with wooden plugs ever so often to be removed and used by firefighters. If there were no plug near the fire, a drill was used to open a new hole to access water and then plugged after the fire was out. Hence, access to water to fight the fire was through the "plug".

Today, a new fire truck takes a year to design, six months to manufacture and $540,000 to purchase. The pumps can pump 15,000 gallons per minute using a single stage impeller. Water is taken from a hydrant using a four inch diameter hose. The hydrants can supply more water than the pump can pump at 250 psi. Pressure is lost as the hose is raised to fight the fire. Ladders extend 95 feet. Trucks are known as Quint Trucks named for the five key features of the truck: pump, water tank, fire hose, aerial device and ground ladders. Cedar Falls carries 130 feet of hose, but rural trucks carry much longer hoses because of the spacing of the hydrants. A fully equipped Quint Truck sells for approximately $1 million. The trucks have the latest engine technology for emissions. Controls permit the engine to block regeneration once the truck's pump is pumping. Lighting is done with LEDs for flood and truck lighting. This reduces the electrical power requirements and puts more horsepower to the pump.

Computer. All of Cedar Falls fire trucks have computers. Communication is the primary work of these computers. Communication with dispatchers can be done continuously using WiFi while the dispatcher handles calls for police and other emergencies. The communications include historical data on the location of the fire such as drunken behaviors, illicit drug usage, belligerent behavior and other social behavior that may require police presence when responding to the fire call.

The former VHF bandwidth of 700 Mhz was given to Public Safety for communication of information. The HDTV sets now make additional communication between Police, Fire and Dispatchers possible to improve public safety. The Site Manager uses an iPad at the site. This enables the Manager to search for schematics, access points, locations of services such as gas and electrical and set up of search grids to locate missing people when necessary. The grids can be as small as 3 feet by 3 feet.

Black Hawk county is currently upgrading its communication network. This means that several Public Safety departments will have communications within and between themselves. Black Hawk, Linn and Johnson counties are working together on this project which will cost $8 to $15 million. The system includes land mobile radios (90% of communications are done with these), an attachment to the National Cellular System for public services, broadband cellular networking so that communications are not bogged down with citizens using cell phones for personal calls. Maintenance of such a system is very expensive, so joining Black Hawk, Linn and Johnson counties will spread the costs and benefit taxpayers. Currently there are two towers in Cedar Falls; the new system will have 6-7 towers for Cedar Falls Public Safety communication. Bandwidth is leased whenever needed and available today.

Computer Aided Dispatch (CAD) has limited capability. The Fire Department wants building layout diagrams and any thermal information available before entering to fight a fire. Today's equipment does not have that capability. The present system has limited bandwidth and cannot supply that information.

Personal Protective Equipment: Thermal vision is available now for a reasonable cost. For $9,000 a Fire Fighter can see the heat and its intensity during a fight. The technology was developed by the military but is now available for Public Safety. One limitation is the inability to see through glass. The Fire Fighters can see where the source of the fire is and better target equipment to extinguish the fire.

Hip boots have been replaced by bunker pants. Jackets are shorter and lighter which reduces fatigue when fighting a fire. The clothing is made of Nomex or polybenzimidazole fiber (PBI) material which is fire resistant (not fire proof). There is an inner liner that acts as a thermal barrier. Helmets can melt at the 1100 °F temperatures at head height while foot height temperatures can reach 200 °F. Helmets will be replaced with leather helmets which are less likely to melt at the upper room heights. Fire Fighters crawl into a fire where the temperatures are cooler.

Self Contained Breathing Apparatus (SCBA) tanks carry 30 to 45 minutes of air for the firemen. It has a Personal Alert Safety System (PASS) device that transmits information to the Incident Manager about the movement of the firemen. If there is no movement for 15 seconds an alarm sounds for all firemen and a signal is sent to the Manager. The Incident Manager and all firefighters at the scene investigate and respond to locate and rescue the fireman. The SCBA equipment weighs about 75 pounds and is worn on the fireman's back.

Firemen are trained in medical rescue. The credentials range from Emergency Medical Technician (EMT), EMT-B (basic), EMT-I (intermediate) and EMT-P (Paramedic) who administers drugs, defibrillators, intravenous fluids, and heart beat information to hospitals.

Technology drawbacks. New home construction is making use of glued floor joists and roof truss plates to secure the building structure. These materials are less fire resistant than previous materials used for these purposes. The glues melt and the metal separates allowing the structures to collapse during a fire. Older homes did not use these construction methods and materials so do not collapse as soon or as easily. Corrugated Stainless Steel Tubing (CSST) is used for natural gas routing in homes. It is installed much like electrical wiring and consists of a continuous, flexible stainless steel pipe with an exterior PVC covering. The material requires special grounding (also called bonding) with the electrical systems since electrical charges can build on the conduit and lead to fires or explosions. Lightning strikes are conducted through the ground and can cause fires if the conduit is not properly bonded.

Home fire alarms can send false signals about fires or intruders. This happens when strong winds shake the building and the motion detector is triggered or the alarm is set off. Weather alone causes few false alarms, but there are still a few each year. False alarm costs, if frequent (four or more in a year), are charged to the property owner. Exceptions are weather- or child-caused alarms.

On the other hand, sprinklers, smoke detectors and 911 dispatchers improve fire containment and enable longer response times. Early containment is just as important as the vehicle travel time to the fire.

Closing. Cedar Falls has a four minute response time target. Currently two fire houses are on Main Street. One at 18th and Main and one at Balboa and Main. The response time between the two is 1.5 minutes so there is much overlap between response times. A better proposal would be to move from 18th and Main to First and Hudson. This would separate the stations and remove the response time overlap. The North Cedar fire station is no longer in service and the plan to build a new station at 8th and Hudson has been abandoned and the ground sold.

If there is a fire and the Fire Fighters have to enter your home, unless a neighbor has a key, the firemen break down the door. For $200 a homeowner could install a fire lock that would permit the entry of firemen during a fire. These are 100% secure and are used for all commercial buildings.

President Dorhout thanked Chief Schilling for his interesting presentation. The meeting adjourned to the 18th and Main station at 8:30 pm where a tour was conducted for the WTS.

Respectfully submitted,

James R. Stevenson