Question 72: Recent drone technology advancements have enabled refiners and contractors to improve the efficiency of maintenance and inspection activities. With this, how are your hot work permits and general safety policies evolving to sustain adequate asset and personnel protection at all times? For instance, what additional safety permits or considerations would apply for drone use and aerial inspections?

PHILLIP NICCUM (KP Engineering)

In June 2016, the Federal Aviation Administration (FAA)announced that it had finalized the first operational rules for routine commercial use of small, unmanned aircraft systems (UASs) including “drones”. According to industry estimates, the rule could generate more than $82 billion for the U.S. economy and create more than 100,000 new jobs over the next 10 years.

The following is a summary of some of the key points in the announcement:

1. The new rule took effect in August 2016 and offers safety regulations for unmanned aircraft and drones weighing less than 55 pounds that are conducting non-hobbyist operations.

2. Importantly, flying a drone for commercial purposes no longer requires a pilot’s license.

3. The person flying a drone must be at least 16 years old and have a remote pilot certificate with a small Unmanned Aircraft Systems rating or be directly supervised by someone with such a certificate. The regulations require pilots to keep an unmanned aircraft within visual line of sight.

Operations are allowed during daylight and twilight, if the drone has anti-collision lights.

The new regulations also address height and speed restrictions and other operational limits.

External load operations are allowed if the object being carried by the unmanned aircraft is securely attached and does not adversely affect the flight characteristics or controllability of the aircraft.

The FAA is offering a process to waive some restrictions if an operator proves that the proposed flight will be conducted safely under a waiver.

Links to the complete FAA Press Release and summary of the first operation rules are included in the AFPM Q&A Answer Book.

C. H. Fenstermaker & Associates, LLC is active in the field of surveying, mapping. They are interpreting the new rules to mean that the following checklist of safety items must be specifically addressed prior to operation in refinery applications:

1.The Lead Operator of the unit must be notified of drone operations, and those employees and contractors within the unit shall be notified of intended drone operations at least 30 minutes prior to flight.

2. As a drone is not intrinsically safe, Hot Work Permits will be required.

3.Proper PPEs –such as hardhat, safety googles and steel-toe boots –are a minimum, in addition to any other unit-specific requirements.

4.Never fly a drone overactive worker unaware of elevated drone inspection activities.

5. Drones may not operate over any persons not directly participating in the operation, not under a covered structure, and not inside a covered stationary vehicle.

6.A Certificate of Waiver or Authorization from the FAA is required anytime you need to conduct Unmanned Aircraft Systems operations outside of the Part 107 rules: for example, flying above 400 feet, in the vicinity of an airport, beyond line of sight, etc.

Here is an actual case story provided by C. H. Fenstermaker & Associates:

While conducting an aerial inspection for a refinery facility, the drone operator was wrapping up an aerial video shoot. With the refinery representative standing next to the drone operator, the drone operator initiated a 100-foot vertical hover while reviewing the checklist before final assent for landing. At that instant, while looking at the flight screen, the drone operator heard the engines rev on the drone, and then immediately looked up to witness the drone bank hard to one side and fall straight down 100 feet. The drone barely missed a series of pipes and valves and crash-landed only feet from an active laser scan crew. Both the refinery representative and drone operator looked at each other in disbelief. What had happened? The refinery representative, who just happened to be watching the drone when the incident occurred, said that he witnessed a large bird attack the drone, knocking it out of the sky. The moral of the story: ...Be prepared at all times... Itis not a matter of if you are going to crash; it is a matter of when. Safety is the first priority, so assume you will crash and use the checklist of safety items, mentioned earlier, to prepare your environment within the crash zone so that minimal impact will occur should the worst-case scenario play out.

Many of Fenstermaker’s clients throughout facilities along the Gulf Coast have either welcomed drone demonstrations or have retained the services of drone companies for those items listed below:

1. Flare stack and vessel inspections.

2. Quantity surveys for stockpiles, pits, dykes, etc.

3. Topographic mapping for plant expansions;?Construction site monitoring.

4. Piperack documentation for inspection isos.

5. Digital surface modeling (DSM)

6. Digital terrain modeling (DTM).

7. re-and post-earthwork quantity verification.

8. Quick update of comprehensive plant sitemap both aerial and planimetric; and/or,

9. Spill containment and prevention plans.

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