Construction Risk Conference

WORKSHOP T2

Tuesday, November 8
10:30 a.m.–12:10 p.m. and 2:20 p.m.–4:00 p.m.

MINIMIZING DRONE RISKS ON A CONSTRUCTION SITE

Presented by

Cindy DePrater
Vice President,
Corporate Director
Environmental Health and Safety
Turner Construction

Aldo Fucentese
Vice President,
Division Underwriting Manager
Liberty Mutual Specialty—
Construction

Michael Mills
Technical Director for
Construction and Energy
Liberty Mutual Insurance

Drones may not be as prevalent at job sites as hammers and hardhats, but they undoubtedly will be before too long. Owners and contractors are increasingly using these unmanned aircraft systems (UAS) to keep tabs on construction progress, inspect work, and even gather data for ongoing 3-D modeling. When regulations that allow widespread use of drones for commercial purposes are approved, the number of drones hovering over construction sites will increase exponentially. This session will outline current regulations for UAS, potential risks, and best practices for avoiding incidents and claims. Insurance options for transferring these risks will also be reviewed.

To print on both sides of the page, set your printer for duplex printing.

Workshop T2

Notes

Cindy DePrater
Vice President, Corporate Director Environmental Health and Safety
Turner Construction

Ms. DePrater is vice president and corporate director for environmental health and safety (EH&S) at Turner Construction, where she is responsible for Turner's EH&S activities worldwide and leads a staff of over 200 safety professionals. She is responsible for analyzing the organization's critical EH&S requirements, identifying issues and potential opportunities, and developing innovative solutions. She has formed strong sustainable relationships with the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), and other governmental agencies and sits on several national committees and advisory boards that influence and impact legislative action for worker health and safety.

Ms. DePrater is a graduate of Oklahoma State University, has numerous certifications and licenses, and holds the distinction of registered Associate of Loss Control Management (ALCM) from Det Norske Veritas. She is a frequent, recognized, and requested speaker on the subject of environmental safety and health at conferences nationwide, as well as a guest lecturer at several universities.

Aldo Fucentese
Vice President, Division Underwriting Manager
Liberty Mutual Specialty—Construction

Mr. Fucentese joined Liberty Mutual in 2003 and completed the company's corporate development program, working for both commercial and personal lines. He has overall underwriting responsibility for national account contractors and for wrap-up and project-specific casualty insurance programs across the United States.

Mr. Fucentese holds a mechanical and naval engineering master's degree from the University of Genoa and an MBA from Boston University. He is also a Professional Engineer (PE) and earned the Chartered Property Casualty Underwriter (CPCU) designation. He is a graduate of the Italian Naval Academy and held several positions as a Navy officer in active duty for 14 years.

Michael Mills
Technical Director for Construction and Energy
Liberty Mutual Insurance

Mr. Mills is technical director for construction and energy at Liberty Mutual Insurance, where he mentors and trains Liberty Mutual Risk Control Services technical consultants in safety and risk management and develops resources on critical industry trends and initiatives. In this role, he collaborates with policyholders to reduce their risk, and he has played a leadership role in setting risk quality standards for Liberty Mutual's construction business.

Mr. Mills has been active on various consensus standards (such as the ANSI/ASME B30 Safety Standards Committee for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings), serves as the chairman for the ANSI/ASME P30.1 Planning for Load Handling Activities Committee, and has been an active member of many B30 committees. He graduated from Chaminade University of Honolulu with a degree in computer science, is a Certified Safety Professional (CSP) in comprehensive practice, and has his Associate in Risk Management (ARM) and Construction Risk and Insurance Specialist (CRIS) certifications.

Minimizing Drone Risks on a Construction Site

Michael Mills
Technical Director of Construction, Liberty Mutual Insurance

Cindy DePrater
Vice President, Environmental Health and Safety, Turner Construction Company

Aldo Fucentese
Division Underwriting Manager, Liberty Mutual Insurance

Learning Objectives

- Have a clearer understanding of the risk factors involved in UAS use.
- Be able to develop a basic UAS safety procedure.
- Understand how to prepare for UAS use on a construction site.
- Effectively reduce your risk through different insurance mechanisms

Drones are Here to Stay

Drones sold **4.2 million** World Wide

Cost as low as **$465**

Camera Costs can be high: **$50,000+**

IRMI Construction Risk Conference 3

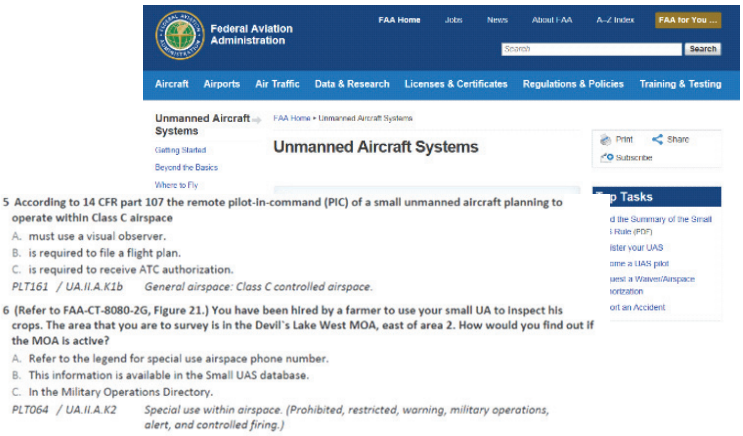
Drone Use in Construction

- Stock Piles
- Job Progress
- Accident Investigation
- Power Lines

IRMI Construction Risk Conference 4

Drone Use for Commercial Purposes

- ✔ Register the drone
- ✔ Remote aircraft pilot certificate
- ✔ Follow the FAA regulations



Final Rule Highlights

Day time Only

VLOS

Restricted Areas

400 feet or below

Final Rule Highlights

Good weather

Must NOT fly over people*

No privacy restrictions

Remote Pilot in Command

- Responsible
- Assess the Operating Area
- Establish Crew support

Final Rule Highlights

- Operated Safely
- Preflight Inspection
- Preflight Briefing

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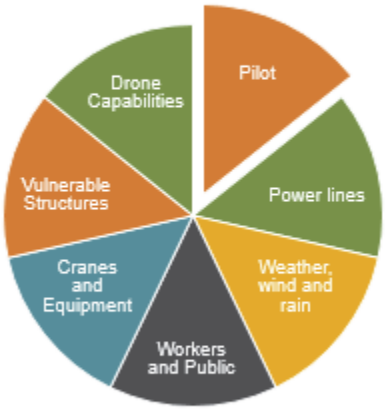
Preflight Assessment



Frequency
(Exposure)

Likelihood
(Chance)

Severity
(Harm)

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Workshop T2

Safety Devices On Drones

TEST FLIGHT TO VERIFY

- Sonar
- GPS
- Loss of Control Input
- Stability

Will you Allow the use of Drones?

CORPORATE DECISION

When?

Why?

If so how?

Dear Xxxx,

We are writing to clarify xxxx position on the use of the drone at the new xxxx project.

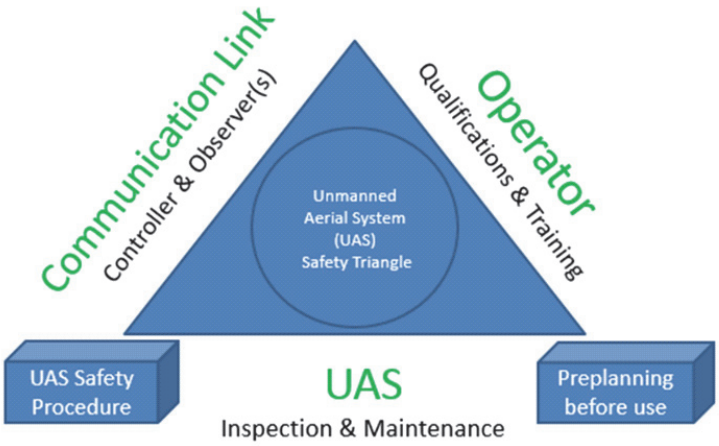
Xxxx policy is that xxxx cannot contract nor pay for any part of the drone usage and xxxx staff cannot direct or otherwise authorize where the drone may fly. The OCIP covering this project, does not insure a drone risk – we advise the xxxx to make sure the drone company has the appropriate insurance for the liability arising out of the drone use. Xxxx will need to be listed as additional insured on the drone operator's Certificate of Insurance. Lastly, the xxxx should verify the drone company is licensed by the FAA.

We ask that prior to re-engaging the drone contractor that the xxxx complete and return the attached Waiver, Release and Hold Harmless Agreement, along with the Drone Company's insurance naming xxxx as additionally insured.

Please call at your earliest convenience should you have questions regarding this matter.

Sincerely,

UAS Safety Triangle



UAS Safety Procedure

Responsibilities, Client, Contractor

Privacy Considerations

General Public Protection

Worker Protection

UAS Safety Procedure

Flight Path Planning

Visual Observers

Inspection, maintenance

Prohibitions

Unmanned Aircraft Systems/Drones Policy

I. Policy Statement
In our ongoing efforts as the leader in construction safety, xxxx has adopted the following policy to ensure that Unmanned Aircraft Systems (UAS)/Drones are operated in a manner that meets or exceeds all known federal, state & local municipality, FAA standards & regulations. The most restrictive guidelines take precedence over our limits. The Remote Pilot in Command (RPC) must strictly adhere to all manufacturer operational requirements. Modifications can only be made according to the manufacturer instructions and approvals. The contractor\vendor, by federal regulation, cannot operate a drone for hire without registering the drone with the FAA and employing a certified RPC. The contractor\vendor must provide xxxx with this documentation.

It is our policy that all drones utilized in xxxx must be from a third party, Registered with the FAA to operate in a commercial setting and insured per xxxx Limits. xxxx CONSTRUCTION EMPLOYEES WILL NOT OPERATE DRONES. Also, ONLY ONE DRONE CAN BE FLOWN ON A PROJECT AT ANY GIVEN TIME.

A coordination meeting must be held to discuss/plan out use of a drone. Discussions must include other drones that might be in the same area being operated by other entities, FAA rules governing use of the drone under this particular scenario, city or state requirements, privacy issues, insurance requirements, flight plans, safety issues and mitigation plan, operating times, date the drone will be in use, protection of the public and workers, neighborhood concerns, type of drone being used, and overall compliance with this policy's rules and regulations. Meeting minutes and a flight plan will be published. A call will be held with Risk Management to review the plan prior to moving forward. All data obtained during the drone flight should be downloaded securely and not erased or duplicated without written approval.

SAMPLE PROCEDURE

UAS Safety Procedure

Project Responsibilities

Risk Assessment

Safety Requirements

UAS's/Drones can be hazardous if operated incorrectly and irresponsibly or without following specific safety guidelines and are operated by the young or inexperienced.

II. Procedures

1. A pre-flight Job Hazard Analysis must be developed by the operator at least 7 days prior to flight. The Job Hazard Analysis meeting and job walk must be held with the RPC prior to actual operation. Look for sources that may cause RF interference (radio towers, transmitters, etc.). If t's reasonable to anticipate that these sources may cause RF interference, then they must be deenergized during the flight, or no flight may take place.
2. The RPC of the UAS/Drone must do a test flight in a clear area to show they have control of the drone. This must include a roll, yaw, back and forth, and a figure 8. If the pilot cannot maintain control they cannot not be allowed to operate on site.
3. Only UAS's/Drones powered by battery are permitted. Fuel operated UAS's/Drones are prohibited.
4. UAS's/Drones can only be operated when visual line of sight is maintained throughout the flight. The use of monitoring, corrective lenses like binoculars, and first person view goggles cannot be used by the operator as they are prohibited by the FAA.

SAMPLE PROCEDURE

Preflight Assessment Sample

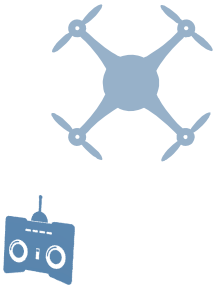
Task	Hazard	Existing Controls	New Controls	New Frequency	New Likelihood	New Severity
Drone flight near Structure	Drone my strike the structure	Preflight Inspection Risk Assessment Pilot Certificate	Cover and protect sensitive equipment and vulnerable process vessels	Highly Frequent	Low Likelihood	Medium Severity
Drone flight near workers	Struck by Falling Drone	Site Plan with flight Path delineated	Barricade flight path Hold a special tool box meeting with workers	Highly Frequent	Low Likelihood	Medium Severity

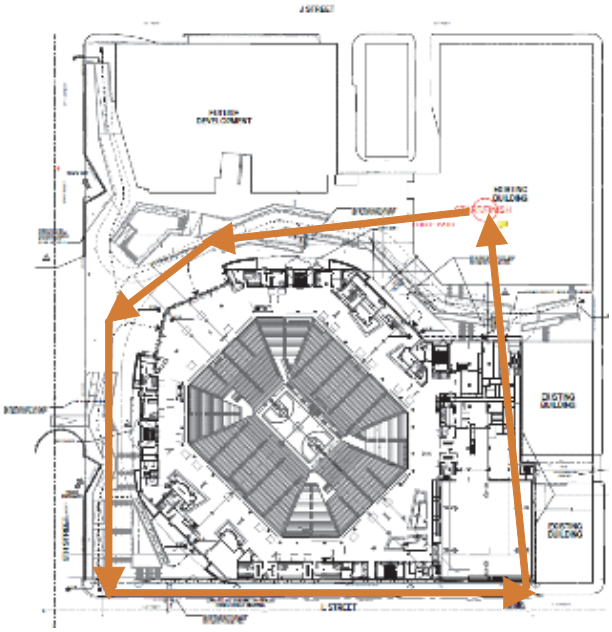
Drone Risk Assessment

Pilot Condition

Weight and Balance

Center of Gravity





Drone Risk Assessment

Work zone boundaries

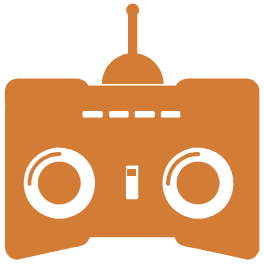
Training for Personnel

Unique client site issues

IV. Employee Safety
Superintendent/Safety Manager:
1. Hazards at the site are mitigated:
   a. Wires/cables/utility lines/cranes identified and flagged or identified on flight plan
   b. Worker areas identified and flight plan adjusted to stay away from workers or workers reassigned to another area.
   c. If you have information that would be helpful to the drone operator please share that information. They will be coming into your project and it is up to you to control safety in the area.
   d. Corporate safety program for drones shared with the pilot/company who operates the drone.
   e. Visitor agreements signed by operator and orientation held.
   f. Safety program reiterated to the pilot, all PPE to be worn discussed, work rules discussed and signed off on.
   g. Property in the vicinity that might be impacted is identified and communicated to the drone operator
   h. Buffer zones established between aircraft and personnel;
   i. Investigate potential alternative landing sites away from workers in case take-off/landing site is obstructed or compromised.

SAMPLE PROCEDURE

Drone Contingency Plan



Communication

Low Battery

Emergency Landing

What can go wrong with a Drone?

- Child loses an eye in Worcestershire, UK
- 5 Spectators Injured in Virginia
- Drone crashes on the Empire State Building
- Drone lands on the White House Lawn

Drones Operational exposures

- ✔ Third-party BI and PD
- ✔ Violation of another's rights
- ✔ Cyber
- ✔ Contractual Liability
- ✔ First party
- ✔ Product Liability

Insuring Unmanned Aircraft Exposures

- No mandatory liability coverage is currently required by law
- Comprehensive general liability (CGL) policy
- Aviation/ drone policy
  - Liability coverage
  - Hull coverage & video/photographic equipment

Does the unendorsed ISO CGL policy provide drone coverage?

Unendorsed CGL ISO coverage in summary

	Coverage A* (BI/PD)	Coverage B* (P&AI)
***Direct Liability*:** Ownership, maintenance or use of any UA, including entrustment of such aircraft to others	x	✓
Vicarious Liability: Another party's use of an UA (not owned, rented or borrowed by the insured) on behalf of the insured	✓	✓
***Contractual Liability*:** Liability assumed by the insured in an "insured contract" for losses arising out of the ownership, maintenance or use of an UA.	✓	x
*Subject to the other terms and provisions of the policy.		

Issues to be aware of

- ISO CGL policy is inadequate to provide UA coverage
- Broader or narrower coverage can be achieved by adding UA liability endorsement(s).
- Many carriers refer coverage back to FAA rules

Endorsement	Number	Effect
Exclusion—Unmanned Aircraft	CG 21 09	Removes all coverage for liability arising out of the ownership, maintenance, use, or entrustment to others of any unmanned aircraft (UA), as well as negligence or other wrongdoing in the hiring, employment, supervision, or training of others regarding the use of any UA.
Exclusion—Unmanned Aircraft (Coverage A Only)	CG 21 10	Removes all coverage for "bodily injury" and "property damage" arising out of the ownership, maintenance, use, or entrustment to others of any UA, as well as negligence or other wrongdoing in the hiring, employment, supervision, or training of others regarding the use of any UA.
Exclusion—Unmanned Aircraft (Coverage B Only)	CG 21 11	Removes all coverage for "personal and advertising injury" arising out of the ownership, maintenance, use, or entrustment to others of any UA, as well as negligence or other wrongdoing in the hiring, employment, supervision, or training of others regarding the use of any UA.
Limited Coverage for Designated Unmanned Aircraft	CG 24 50	Allows coverage for "bodily injury" and "property damage" as well as "personal and advertising injury" in connection with designated UA used in conjunction with scheduled operations or projects. Also allows for an optional UA aggregate limit (subject to the policy's other aggregate limits).
Limited Coverage for Designated Unmanned Aircraft (Coverage A Only)	CG 24 51	Allows coverage for "bodily injury" and "property damage" in connection with designated UA used in conjunction with scheduled operations or projects. Also allows for an optional UA aggregate limit (subject to other applicable policy limits).
Limited Coverage for Designated Unmanned Aircraft (Coverage B Only)	CG 24 52	Allows coverage for "personal and advertising injury" in connection with designated UA used in conjunction with scheduled operations or projects. Also allows for an optional UA aggregate limit (subject to other applicable policy limits).

Aviation/Drone policy

- Types of policies
  - Owned drones
  - Non-owned coverage
- Coverage available
  - Drone & Operator liability
  - P & AI
  - Hull
- Exposure not covered
  - Fines
  - PD to your owned property and property in "care, custody & control"
- Relatively inexpensive
- 5-10 admitted US insurers

Hull coverage

First-party property exposure

Not provided by standard first party policies

10% deductible and 10% premium

Self-insure?

Hiring the Right Drone Vendor/Contractor

Insurance

Flight Operations Manual

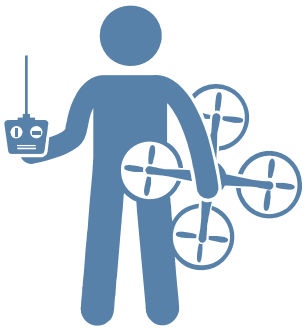
Risk Analysis Form

Hiring the Right Drone Operator

Pilots Qualifications

Hours of Flight

Training

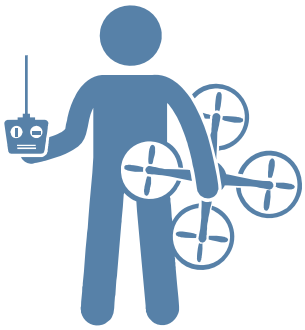


Hiring the Right Drone Operator

Sample Preflight Inspection

Maintenance Requirements

Sample Preflight Briefing



Resources

Federal regulations on drones:
https://www.faa.gov/uas/

Federal Guidance on Privacy:
http://www.ntia.doc.gov/files/ntia/publications/voluntary_best_practices_for_uas_privacy_transparency_and_accountability_0.pdf

E-learning Site for Drones:
https://www.faasafety.gov

http://unmannedsafetyinstitute.org/

Q&A

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Notes