



Remote Assessment Methods

Real Time or “Livestream”: Walkthrough during online meeting and ability for remote participants to observe/ask questions during.




Pre-Recorded: Review pre-recorded operations footage, photos, data
– Review/discuss during a later meeting

Still Images and Data: Review plant drawings, process diagrams, utility data, photos, self-audit or “intake” results
– Review/discuss during a later meeting.

Hybrid: Any/all of above.



Remote Video and Platform Options

<u>Situation</u>	<u>Camera Equipment</u>	<u>Tips</u>
<u>Livestream</u> <i>(During Meeting)</i>	Smart phone Tablet	Stabilizer for phone helpful Landscape view Tag team (one for camera, one for voice) Noise-blocking headphones for loud areas Battery pack (if phone overheat, or quick drain) Practice videographer skills beforehand
<u>Stationary Pre-Recorded Footage</u> <i>(Prior to Meeting)</i> 	Security type camera <i>(Stationary)</i> 	Some have pan/tilt/zoom features Some detect motion and move to that point Record longer footage of operations - Can view prior to meeting (in time lapse)
<u>Live Pre-Recorded Footage</u> <i>(Prior to Meeting*)</i>	Action/Sport type <i>(Hand held or mounted)</i> 	*Cannot directly connect to online meeting Stabilizer recommended if hand-held

Meeting Platforms: Use what client knows/uses --- Adapt

Zoom, Google Meet, Skype, MS Teams, Facetime/Duo, Facebook Messenger Rooms



Cameras & Accessories

Hand-held cell *(stabilizer optional, but helpful! ~\$120)*



Headband mount for cell

(~\$120 Pre-record, can't converse during)



Stationary "security" type camera

(Pre-record)

(\$40 on up, maybe more \$ for pan/tilt/zoom)



Action/sports camera (shown with headband mount)

(Pre-recording – can't connect direct to online meeting)

(~\$300 on up, stabilizer helpful if hand-held, ~\$120)



Many Benefits of Going Virtual

But Some Minor Limitations for Remote Participants

- Can't use sense of smell (*VOCs, burning smells, other*)
- Can't use sense of touch (*detecting heat, dusty surfaces*)
- Can't use sense of hearing in some cases
(*Compressed air leaks, mechanical noises*)
(*"Phone relay" in louder background noise zones*)
- Some visual limitations
(*Distinguish fluids/spills on ground, e.g., sheen vs water*)
(*Airborne dust or aerosols*)
- Narrow, unfocused/panning views
(*Quality view for remote participants depends on camera skills*)
- Harder to interact with site personnel, see personal reactions
- May be difficult to determine overall housekeeping in the facility
- Can't read labels, SOPs, signage, etc on video
(*Nameplates, control panels, waste or chemical labels: close-up photos needed*)



Pre-Walkthrough Information

Allows More Efficient and Comprehensive Results

- Is client able AND willing to provide data, information, and pictures beforehand?
- Encourage - Especially relating to their “Environmental Pain” points
 - Client will have more “skin in the game”



Photo by [Andrea Piacquadio](#) from [Pexels](#)

- If it doesn't happen before, use the debrief to arrange for additional data

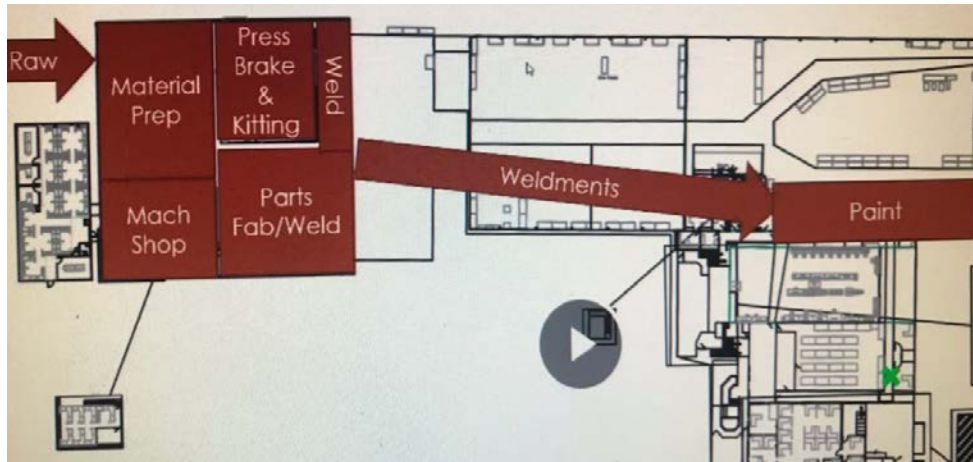
Examples of Useful Information and Data Prior to Walkthrough



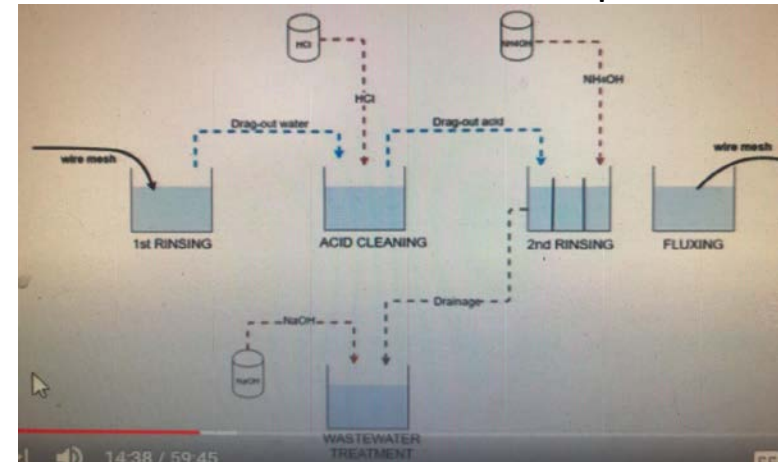
Data, Information and Footage, Pre-Walkthrough (As Relevant to Client, and Ability to Provide)

Production flow diagrams, process-specific diagrams, VSMs, and/or written steps

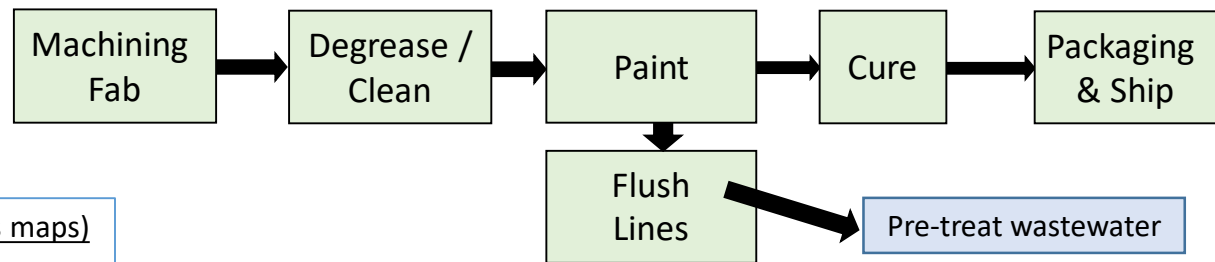
Detailed



Process or "Resource" Specific



Basic

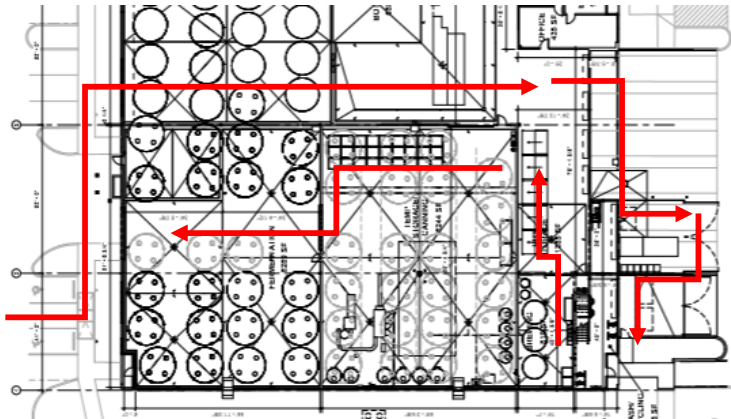


Written Process Steps (if no process maps)

- 1) De-package raw material
- 2) Machine and deburr
- 3) Clean/degrease
- 4) Powder Coat
- 5) Oven Cure ... (etc)

Pre-Walkthrough Information

- Floor plan and route
- Aerial views (zoom in and out)
 - Exhaust/HVAC on roof
 - Roof condition/Galvanized
 - Outdoor junk /storage
 - Vehicles and forklifts
 - Shipping/Receiving bays
 - Nearby water bodies





Pre-Walkthrough

- Utility Data (Bills): Water and sewer, Electricity, Gas, Wastewater (6 mo+)
- Sub-metering data if available
- Equipment control panels
 - Pressure
 - Temperature
 - Flow
 - Energy use
 - Capacity
- Standard Operating Procedures (SOPs)
- Permits, especially if approaching limits or having intermittent violations
 - Wastewater
 - Air
 - Hazardous waste/RCRA
 - Stormwater/NPDES

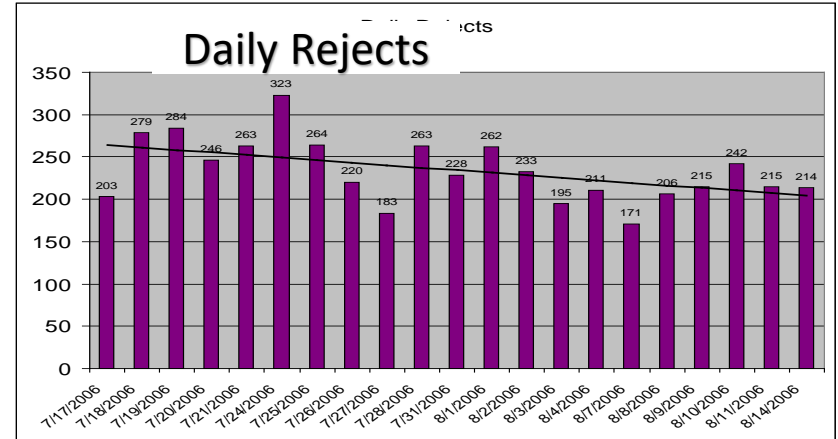
Pre-Walkthrough

Client Send “Evidence” of Environmental Pain

- Production yield or defect yield data spreadsheets/charts
- Examples of raw material, scrap and value-added product losses



Batter coating loss from vibrational alignment



Ergonomics, blocked lighting

=

Missed defects and >rework



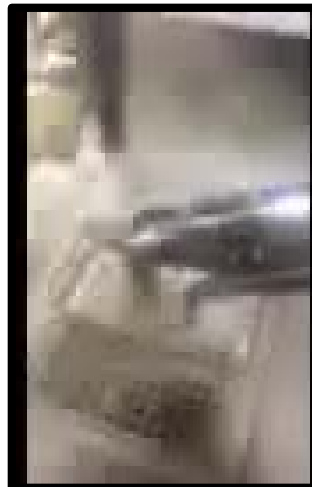
Pre-Walkthrough Photos and Short Videos

- Nameplates on larger energy or water-consuming equipment
- Hazardous waste labels, signage, spill kits instructions, etc.
- Names /photos (and/or SDS) of chemical products of concern
- Scrap
- Oil, chemical, water leaks



Chemicals at one workstation!

- Effluent or emissions
 - *Short videos can be e-mailed*



Pre-Walkthrough: Intermittent, Non-Value Added Processes Not Viewable During Walkthrough

- Batch, product, or color change-outs
- Equipment cleaning and product transfers (*e.g., tank cleaning after transfer of finished beverage run to bottling, brewery side-streaming of yeast*)



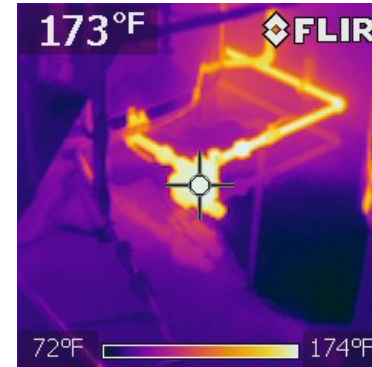
- Second-, third-shift, or nightly activities (such as sanitation, equipment covers)

Pre-, Post-, or During- Walkthrough: Sub-meters & Other Data Gathering (Loaners?)

- Amp logger(s)



- Thermal imaging (IR)



- Refractometer (*beverage*)

- Thermocouple/temperature measurement

- Ultrasonic air leak detector



- Water flow meter(s)



- Decibel meter



Pending Remote Assessment Tip Sheet Joint Effort (PPRC, OTA, ERG, EPA)

Interested in capturing your experiences too!

Initial Planning Meeting(s) Checklist

Scope/Roles/Confidentiality...

Dry-Run Checklist

Camera Practice/Connectivity...

Day-of Walkthrough Checklist

Debrief/Next Steps

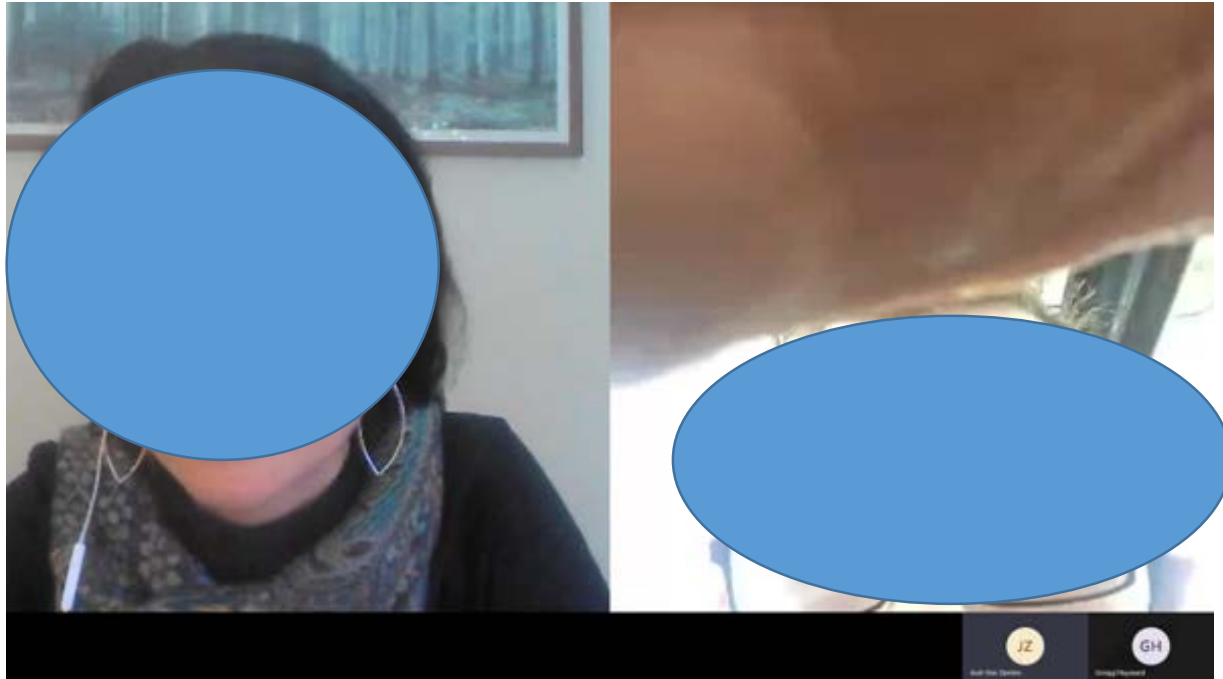


Few Short Video Examples

Please see presentation recording for the videos.



WHY A TECHNOLOGY DRY-RUN IS A GOOD IDEA



THEN TRIED TO USE PHONE WITHOUT BEING ABLE TO SEE WHAT WAS ON THE CAMERA

(SWITCHED TO A TABLET) – THE LESSON: BE ADAPTABLE!!



FOCUS AND DISTANCE





STABILIZER WOULD BE HELPFUL

PANNING

LIQUID ON FLOOR (WATER? OIL?)



PANNING/FOCUS/STABILIZER CAN'T READ LABELS (RIGHT DETAILED LABELS)





TRY TO GET A LITTLE CLOSER TO THE ACTION
TO BETTER SEE DRAGOUT LOSSES

WASTEWATER
COLLECTION
TROUGH



FINGERS IN FRONT OF LENS
WHILE TRYING TO POINT OUT WHERE A WATER LINE IS GOING



DEBRIEF WITH ALL PARTICIPANTS (Immediately Following While Fresh)

- Discuss issues, findings, revelations, (continue recording this segment if allowed)
- Preliminary brainstorm potential solutions/prioritization matrix
- Assign next steps, including additional data gathering



Resources and Contact Information

Remote Visits: Tip Sheet (*Currently Under Development*)

Webinar: P2 Virtual Assessment Training (9/23/20) (*Link Pending*)

<https://www.epa.gov/p2/epa-pollution-prevention-webinar-series#past>

Webinar: Virtual P2 Technical Assistance: Modifying the Service Model During COVID-19

<https://www.youtube.com/watch?v=90U3EEyrA18>

OTA Virtual Site Visit Preparation Template

<https://www.mass.gov/doc/ota-virtual-site-visit-preparation-template/download>

Virtual Site Visit Instructions for OTA Clients

<https://www.mass.gov/doc/virtual-site-visit-instruction-for-ota-clients/download>



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