



DIAR Transmission Drone Imagery Assessment Manual

October 23, 2020

Revision 1



QA/QC will assess our assets based on the applicable TCM component and condition codes shown on the final pages of this manual. A full separate CORE user guide will be provided to the DIRT.

These codes will also be provided to the assessors in the form of a “cheat sheet” for them to consult during the assessment process.

A drop-down checklist will be completed within CORE for the imagery assessors to confirm that they looked at all required content on each structure. The response options for the checklist will consist of “Yes”, “No”, and “N/A”.

- Yes:** Assessor reviewed all content
- No:** Will only be used by the assessor if unable to properly review an item due to poor / insufficient imagery (this will trigger follow-up to ensure content is properly assessed)
- N/A:** Will only be used if certain content does not exist on the asset

The content of the checklist will be as follows:

Structure

Cross Arms

Guying

**Insulators/Trunnions/Shoes/
Dead-Ends**

Hardware

Static/OPGW

Sleeves / Conductors / Connectors

Switches/Equipment/Lights

CIPs/Comm (ADSS)

Mark as assessed

Please confirm that you assessed the following:

Part	Yes	No	N/A
Structure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crossarms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insulators / Trunnions / Shoes / Compression Dead-ends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hardware	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Static/OPGW	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleeves/Conductors/Connectors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Switches/Equipment/Lights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CIPs/Comm (ADSS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NOTES

CANCEL
CONFIRM



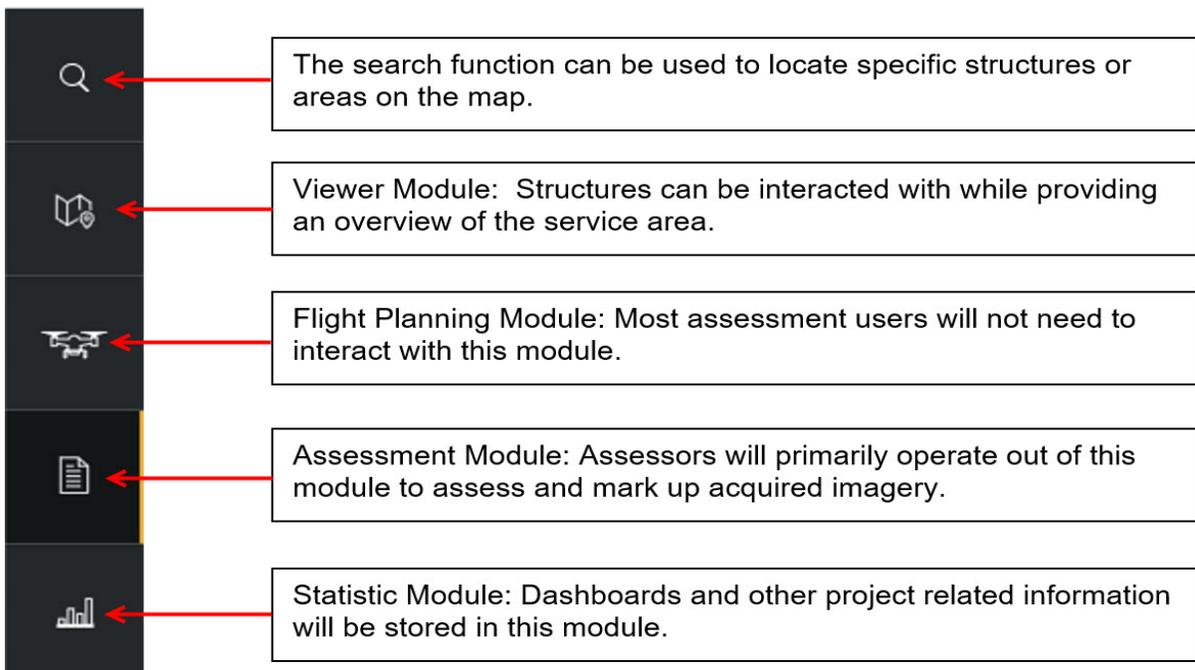
Defined below are the severity tiers and their respective response timelines to which the assessors will assign to each item found. These severity tiers match TCM's process.

Severity	Timeline
4	90 Days
5	Immediate

Reports & Process Information:

Drone pilots will submit their vetted photos through the Operator App to their company's respective CORE environment to be quality checked and approved. Once the images associated to a structure are approved, they will then be pushed to the assessment module in CORE where QA/QC will have access. QA/QC can then begin their assessment process. Structures missing photos or that have low quality/blurry photos shall be submitted to re-fly. Assessment of structures needing re-flies shall not transpire until the missing or corrected photos are uploaded into CORE. Issues identified will be marked up and reports will be generated. TCM will then receive a CSV export containing any relevant issue information, as well as a CORE export PDF report for any assessment batch to which observations were noted. See CORE user guide for more details.

CORE Functions (Main Screen)





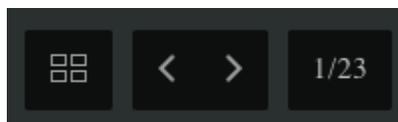
ASSESSMENTS

Once a QEW has entered an assessment order and has selected a structure the menu on the right will appear. The primary function of this menu is to allow the QEW to create an observation as needed on an image of the structure they are assessing. All photos for each structure shall be assessed, in fine detail, utilizing pan and zoom.

By clicking “Add Observation” the QEW will have access to various markup tools, including arrows and boxes as seen below.



After creating the observation, the QEW can then continue to navigate through the imagery by using the thumbnail function (the below button with 4 boxes) or by clicking through one by one (using the arrows shown below).



ASSESSMENT ✕

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ASSIGNED ISSUES

1	1	0	0
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Breakdown of the severity of issues assigned to this asset.

ADD OBSERVATION

MARK AS ASSESSED

SEND TO RE-FLY / RESUBMIT



ADD OBSERVATION ✕

OBSERVATIONS INFO

TOOLS

👉 □ ↶ Tt 📄

LOCATION

Select Location ▼

COMPONENT

Select Component ▼

CONDITION

Select Condition ▼

STRUCTURE TYPE

Select Structure Type ▼

PARTY TO ADVISE

Please select party to advise ▼

ADDITIONAL PARTY TO ADVISE (optional)

N/A ▼

SEVERITY

▼

DESCRIPTION (optional)

SAVE OBSERVATION

The observation tab will open on the right side. This is where QEW's will provide the following details:

Location: references where on the structure the issue was found

Component: indicates the component on the structure that the issue is related to

Condition: refers to the condition of the selected component

Structure Type: provides the option to select wood, non-wood, or tower

Party to Advise: this dropdown allows the user to select a department that should be provided the issue information

Additional Party to Advise: an extra dropdown in case two parties are needed

Severity: indicates how soon the issue must be corrected

Description: allows the user to describe the issue observed.



TCM Components and Conditions

Acronym	Component	Code	Condition
CAF	Access Road	7	Blocked, No Access
ABZ	Anchor Rod Extensions	106	Installation Required
ABZ	Anchor Rod Extensions	63	Rust (Heavy)
BAE	Anchor Rod Ground Wire	8	Broken
BAE	Anchor Rod Ground Wire	105	Grounding Required
BAE	Anchor Rod Ground Wire	106	Installation Required
BAE	Anchor Rod Ground Wire	45	Missing
AAC	Anchor Rods	87	3 Guys-1Rod
AAC	Anchor Rods	8	Broken
AAC	Anchor Rods	101	Brushing Required
AAC	Anchor Rods	15	Damaged
AAC	Anchor Rods	21	Earth - Covered With
AAC	Anchor Rods	29	Flashed
AAC	Anchor Rods	105	Grounding Required
AAC	Anchor Rods	109	Replacement Needed
AAC	Anchor Rods	63	Rust (Heavy)
AAC	Anchor Rods	73	Trees Too Close
AAC	Anchor Rods	111	Trimming Required
AAC	Anchor Rods	78	Vegetation Overgrown
BAA	Area Around Footer(s)	101	Brushing Required
BAA	Area Around Footer(s)	73	Trees Too Close
BAA	Area Around Footer(s)	78	Vegetation Overgrown
CAA	Area Around Span	202	Balloon-Mylar
CAC	Area Around Structure	101	Brushing Required
CAC	Area Around Structure	73	Trees Too Close
CAC	Area Around Structure	78	Vegetation Overgrown
CAB	Area Underneath Span	73	Trees Too Close
CAD	Area Underneath Structure	78	Vegetation Overgrown
AAG	Bolt(s)	2	Backed Out-Off
AAG	Bolt(s)	42	Loose
AAG	Bolt(s)	45	Missing
AAG	Bolt(s)	63	Rust (Heavy)
FAE	Bolted Spacer	8	Broken
FAE	Bolted Spacer	15	Damaged
FAE	Bolted Spacer	42	Loose
JAB	Bond (Specify)	15	Damaged
JAB	Bond (Specify)	86	Open
AAH	Bond Wire	89	Blown
AAH	Bond Wire	8	Broken



TCM Components and Conditions

Acronym	Component	Code	Condition
AAH	Bond Wire	45	Missing
AAH	Bond Wire	86	Open
AAJ	Brace(s)	8	Broken
AAK	Bridge	205	Bird Nest
DAB	Cold End Clevis Pin	2	Backed Out-Off
DAB	Cold End Clevis Pin	63	Rust (Heavy)
DAC	Cold End Clevis-Shackle	45	Missing
DAD	Cold End Cotter Key(s)	2	Backed Out-Off
DAD	Cold End Cotter Key(s)	45	Missing
DAD	Cold End Cotter Key(s)	63	Rust (Heavy)
DAF	Cold End Nut(s)	45	Missing
DAG	Cold End Pin(s)	6	Blackening
GCC	Comm Cable	8	Broken
GCC	Comm Cable	10	Clearance-Insufficient
GCC	Comm Cable	15	Damaged
GCC	Comm Cable	115	Maintenance Required
GCC	Comm Cable	75	Unwrapping
ABJ	Complete Steel Pole	15	Damaged
ABJ	Complete Steel Pole	39	Leaning-Tilted
ABJ	Complete Steel Pole	109	Replacement Needed
ABJ	Complete Steel Pole	63	Rust (Heavy)
ABJ	Complete Steel Pole	73	Trees Too Close
ABC	Complete Tower	202	Balloon-Mylar
ABC	Complete Tower	205	Bird Nest
ABC	Complete Tower	7	Blocked, No Access
ABC	Complete Tower	101	Brushing Required
ABC	Complete Tower	73	Trees Too Close
ABC	Complete Tower	78	Vegetation Overgrown
ABK	Complete Wood Pole	202	Balloon-Mylar
ABK	Complete Wood Pole	7	Blocked, No Access
ABK	Complete Wood Pole	8	Broken
ABK	Complete Wood Pole	10	Clearance-Insufficient
ABK	Complete Wood Pole	13	Cracked
ABK	Complete Wood Pole	15	Damaged
ABK	Complete Wood Pole	28	Fire Damage
ABK	Complete Wood Pole	31	Foreign Object (Specify)
ABK	Complete Wood Pole	39	Leaning-Tilted
ABK	Complete Wood Pole	40	Lightning Strike
ABK	Complete Wood Pole	100	Patrol Insp Required



TCM Components and Conditions

Acronym	Component	Code	Condition
ABK	Complete Wood Pole	109	Replacement Needed
ABK	Complete Wood Pole	60	Rotten
ABK	Complete Wood Pole	65	Split
ABK	Complete Wood Pole	73	Trees Too Close
ABK	Complete Wood Pole	123	Trim Vegetation Away From Transmission Lines
ABK	Complete Wood Pole	111	Trimming Required
ABK	Complete Wood Pole	81	Woodpecker Hole(S)
GAE	Conductor (Complete)	202	Balloon-Mylar
GAE	Conductor (Complete)	8	Broken
GAE	Conductor (Complete)	10	Clearance-Insufficient
GAE	Conductor (Complete)	15	Damaged
GAE	Conductor (Complete)	27	Fallen
GAE	Conductor (Complete)	31	Foreign Object (Specify)
GAE	Conductor (Complete)	33	Gunshot
GAE	Conductor (Complete)	35	Heat Damage
GAE	Conductor (Complete)	209	Kite
GAE	Conductor (Complete)	115	Maintenance Required
GAE	Conductor (Complete)	73	Trees Too Close
GAE	Conductor (Complete)	213	Wire Contact
GAF	Conductor Strand(s)	8	Broken
GAF	Conductor Strand(s)	15	Damaged
GAF	Conductor Strand(s)	33	Gunshot
GAH	Connectors	15	Damaged
GAH	Connectors	35	Heat Damage
GAH	Connectors	42	Loose
AAL	Cross Arms	205	Bird Nest
AAL	Cross Arms	8	Broken
AAL	Cross Arms	13	Cracked
AAL	Cross Arms	18	Deterioration
AAL	Cross Arms	109	Replacement Needed
AAL	Cross Arms	60	Rotten
AAL	Cross Arms	63	Rust (Heavy)
AAL	Cross Arms	65	Split
AAL	Cross Arms	81	Woodpecker Hole(S)
EAG	Damper (Complete)	202	Balloon-Mylar
AFR	Fiberglass Rod	117	Assessment Required
BAC	Footings (Complete)	73	Trees Too Close
BAC	Footings (Complete)	78	Vegetation Overgrown
EAK	Full-Tension Splice	37	Installation-Improper



TCM Components and Conditions

Acronym	Component	Code	Condition
CAG	Gate(s)	7	Blocked, No Access
KAE	Ground Connection	8	Broken
KAE	Ground Connection	19	Disconnected
KAE	Ground Connection	106	Installation Required
KAE	Ground Connection	42	Loose
KAE	Ground Connection	45	Missing
BAD	Ground Grid Taps	8	Broken
BAD	Ground Grid Taps	15	Damaged
BAD	Ground Grid Taps	42	Loose
BAD	Ground Grid Taps	45	Missing
KAF	Ground Link Box	35	Heat Damage
AAO	Guy Wire - Anchor	8	Broken
AAO	Guy Wire - Anchor	15	Damaged
AAO	Guy Wire - Anchor	42	Loose
AAO	Guy Wire - Anchor	45	Missing
AAO	Guy Wire - Anchor	63	Rust (Heavy)
AAO	Guy Wire - Anchor	111	Trimming Required
AAO	Guy Wire - Anchor	212	Vehicle Contact
ABN	Guy Wire - OH	8	Broken
ABN	Guy Wire - OH	10	Clearance-Insufficient
ABN	Guy Wire - OH	15	Damaged
ABN	Guy Wire - OH	105	Grounding Required
ABN	Guy Wire - OH	84	Isolating Insulators-Install
ABN	Guy Wire - OH	91	Isolating Insulators-Remove
ABN	Guy Wire - OH	42	Loose
ABN	Guy Wire - OH	115	Maintenance Required
ABN	Guy Wire - OH	45	Missing
ABN	Guy Wire - OH	109	Replacement Needed
ABN	Guy Wire - OH	63	Rust (Heavy)
ABN	Guy Wire - OH	73	Trees Too Close
FAA	Hairpin Spacer	202	Balloon-Mylar
FAA	Hairpin Spacer	15	Damaged
FAC	Hairpin Strand End(s)	54	Out Of Lay
AAQ	Hardware	8	Broken
AAQ	Hardware	35	Heat Damage
AAQ	Hardware	42	Loose
AAQ	Hardware	45	Missing
AAQ	Hardware	63	Rust (Heavy)
DAJ	Hot End Clevis Pin	2	Backed Out-Off



TCM Components and Conditions

Acronym	Component	Code	Condition
DAL	Hot End Cotter Key(s)	2	Backed Out-Off
DAO	Hot End Pin(s)	2	Backed Out-Off
DAP	Hot End Yoke Plate	202	Balloon-Mylar
DAP	Hot End Yoke Plate	63	Rust (Heavy)
DAW	Insulators-Ceramic, Post, 69kv	202	Balloon-Mylar
DAW	Insulators-Ceramic, Post, 69kv	8	Broken
DAW	Insulators-Ceramic, Post, 69kv	29	Flashed
DAW	Insulators-Ceramic, Post, 69kv	63	Rust (Heavy)
DAR	Insulators-Ceramic, Standard, 20K	202	Balloon-Mylar
DAR	Insulators-Ceramic, Standard, 20K	205	Bird Nest
DAR	Insulators-Ceramic, Standard, 20K	8	Broken
DAR	Insulators-Ceramic, Standard, 20K	29	Flashed
DAR	Insulators-Ceramic, Standard, 20K	63	Rust (Heavy)
DAS	Insulators-Ceramic, Standard, 30K	8	Broken
DAS	Insulators-Ceramic, Standard, 30K	29	Flashed
DAS	Insulators-Ceramic, Standard, 30K	63	Rust (Heavy)
DAT	Insulators-Ceramic, Standard, 40K	8	Broken
DAT	Insulators-Ceramic, Standard, 40K	30	Foreign Object (Bird's Nest)
DAT	Insulators-Ceramic, Standard, 40K	63	Rust (Heavy)
DAU	Insulators-Ceramic, Standard, 50K	63	Rust (Heavy)
HAA	Insulators-Conductor	202	Balloon-Mylar
DBI	Insulators-NCI, 138kv	202	Balloon-Mylar
DBI	Insulators-NCI, 138kv	15	Damaged
DBI	Insulators-NCI, 138kv	29	Flashed
DBU	Insulators-NCI, 230kv	202	Balloon-Mylar
DBU	Insulators-NCI, 230kv	205	Bird Nest
DBU	Insulators-NCI, 230kv	15	Damaged
DBU	Insulators-NCI, 230kv	29	Flashed
DBG	Insulators-NCI, 69kv	202	Balloon-Mylar
DBG	Insulators-NCI, 69kv	15	Damaged
DBG	Insulators-NCI, 69kv	29	Flashed
DBG	Insulators-NCI, 69kv	63	Rust (Heavy)
DBT	Insulators-Post, NCI, 138kv	205	Bird Nest
DBT	Insulators-Post, NCI, 138kv	15	Damaged
DBT	Insulators-Post, NCI, 138kv	29	Flashed
DAZ	Insulators-Post, NCI, 69kv, Long	202	Balloon-Mylar
DAZ	Insulators-Post, NCI, 69kv, Long	15	Damaged
DAZ	Insulators-Post, NCI, 69kv, Long	29	Flashed
DBA	Insulators-Post, NCI, 69kv, Short	202	Balloon-Mylar



TCM Components and Conditions

Acronym	Component	Code	Condition
DBA	Insulators-Post, NCI, 69kv, Short	15	Damaged
DBA	Insulators-Post, NCI, 69kv, Short	29	Flashed
EBB	Jumper - Connector	35	Heat Damage
EAL	Jumper (Complete)	89	Blown
EAL	Jumper (Complete)	10	Clearance-Insufficient
EAL	Jumper (Complete)	15	Damaged
EAL	Jumper (Complete)	35	Heat Damage
EAL	Jumper (Complete)	37	Installation-Improper
EAN	Jumper Strand(s)	8	Broken
EAN	Jumper Strand(s)	10	Clearance-Insufficient
EAN	Jumper Strand(s)	15	Damaged
GAQ	Lightening Arrestors	15	Damaged
DBV	NCI Term-69kv	202	Balloon-Mylar
DBV	NCI Term-69kv	205	Bird Nest
DBV	NCI Term-69kv	15	Damaged
DBV	NCI Term-69kv	29	Flashed
ABI	Other(Specify)	202	Balloon-Mylar
ABI	Other(Specify)	205	Bird Nest
ABI	Other(Specify)	15	Damaged
ABI	Other(Specify)	81	Woodpecker Hole(S)
AAW	Pin(s)	63	Rust (Heavy)
ACD	Pole Butt	13	Cracked
ACD	Pole Butt	15	Damaged
ACD	Pole Butt	28	Fire Damage
ACD	Pole Butt	60	Rotten
ACD	Pole Butt	63	Rust (Heavy)
ACD	Pole Butt	73	Trees Too Close
ACD	Pole Butt	78	Vegetation Overgrown
BAJ	Pole Ground (Wire)	8	Broken
BAJ	Pole Ground (Wire)	15	Damaged
BAJ	Pole Ground (Wire)	45	Missing
ABY	Pole Top	202	Balloon-Mylar
ABY	Pole Top	205	Bird Nest
ABY	Pole Top	13	Cracked
ABY	Pole Top	30	Foreign Object (Bird's Nest)
ABY	Pole Top	39	Leaning-Tilted
ABY	Pole Top	60	Rotten
ABY	Pole Top	65	Split
ABY	Pole Top	81	Woodpecker Hole(S)



TCM Components and Conditions

Acronym	Component	Code	Condition
AFP	Preform	8	Broken
AFP	Preform	63	Rust (Heavy)
CAE	Right-Of-Way (Total)	7	Blocked, No Access
EAQ	Shield Wire (Complete)	8	Broken
EAQ	Shield Wire (Complete)	15	Damaged
EAQ	Shield Wire (Complete)	31	Foreign Object (Specify)
AAV	Shieldwire Attachment Point	35	Heat Damage
EAS	Shoe (Complete)	8	Broken
EAS	Shoe (Complete)	13	Cracked
EAS	Shoe (Complete)	63	Rust (Heavy)
GBE	Shoe Cotter Key	45	Missing
GBF	Shoe Nut(s)	45	Missing
EAW	Shoe U-Bolt(s)	202	Balloon-Mylar
EAK	Splices	8	Broken
JAO	Structure (Complete)	7	Blocked, No Access
JAO	Structure (Complete)	81	Woodpecker Hole(S)
BAG	Stub Angles	63	Rust (Heavy)
ABV	Stub Pole - Anchor Guy	8	Broken
ABV	Stub Pole - Anchor Guy	63	Rust (Heavy)
ABO	Stub Pole - Steel	15	Damaged
ABO	Stub Pole - Steel	63	Rust (Heavy)
ABP	Stub Pole - Wood	8	Broken
ABP	Stub Pole - Wood	109	Replacement Needed
ABP	Stub Pole - Wood	60	Rotten
ABP	Stub Pole - Wood	65	Split
ABP	Stub Pole - Wood	81	Woodpecker Hole(S)
GAW	Suspension Shoe Nut(s)	45	Missing
ABW	Switch - Arcing Horn	8	Broken
ABW	Switch - Arcing Horn	93	Out Of Adjustment
ABT	Switch - Contacts	2	Backed Out-Off
ABT	Switch - Contacts	15	Damaged
ABT	Switch - Contacts	48	Not Seated
ABT	Switch - Contacts	93	Out Of Adjustment
ABA	Switch (Complete)	205	Bird Nest
ABA	Switch (Complete)	8	Broken
ABA	Switch (Complete)	15	Damaged
ABA	Switch (Complete)	93	Out Of Adjustment
ABB	Switch Handle	8	Broken
AAT	Tower-Leg(s)	15	Damaged
AAT	Tower-Leg(s)	63	Rust (Heavy)