



IES AVIATION LIGHTING COMMITTEE

**ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA
ANNUAL AVIATION LIGHTING CONFERENCE**

October 22, 2014

Orlando, FL

In-pavement Fixture Torqueing Procedure Improvements

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ADB=
Airfield Solutions

Airfield. Our Field.

Overview

- Regulatory Requirements for In-pavement Fixture Torqueing
 - Why torqueing is a topic today
- One Airport's Experience
- Use Case- Implementation of a torqueing solution
- Conclusion

Regulatory Requirements



Regulatory Requirements



Federal Aviation Administration National Part 139 CertAlert

****Advisory**Cautionary**Non-Directive**Advisory**Cautionary**Non-Directive**Advisory**Cautionary**Non-Directive****

Date: June 25, 2014 **No. 14-03**
To: Airport Operators, FAA Airport Certification Safety Inspectors (ACSIIs)
Subject: Preventive Maintenance of In-Pavement Lighting Systems
Point of Contact: Randy Moseng, AAS-300, (404) 474-5114
Alvin Logan, AAS-100 (202) 267-8743

- 1. Purpose.** This CertAlert informs airport operators of a recent incident in which a departing air carrier aircraft dislodged an in-pavement runway light fixture, causing significant damage to the aircraft. It reminds them to properly maintain lighting systems as required by 14 Code of Federal Regulations part 139.311(d). This section states, "Each certificate holder must properly maintain each marking, sign, or lighting system installed on the airport." Airports comply with this requirement through routine inspections and by applying a detailed preventive maintenance program.

2. Details. This incident occurred on June 14, 2014, at [redacted] resulting from the failure of [redacted]

Regulatory Requirements



Transport
Canada

Transports
Canada

Document No. /Document n° : CASA 2014-05

Issue No. /Numéro d'édition : 01

Date : 2014-09-19

Page : 1 of/de 3

CIVIL AVIATION SAFETY ALERT

ALERTE A LA SECURITE DE L'AVIATION CIVILE

ATTENTION:

AIRPORT OPERATORS
TRANSPORT CANADA CIVIL AVIATION
SAFETY INSPECTORS - AEROROMES

À L'ATTENTION DE :

LES EXPLOITANTS D'AÉROPORTS
LES INSPECTEURS DE LA SÉCURITÉ DE
L'AVIATION CIVILE DE TRANSPORTS
CANADA - AÉRODROMES

PREVENTIVE MAINTENANCE OF INPAVEMENT LIGHTS

TRAVAUX D'ENTRETIEN PRÉVENTIF DES FEUX ENCASTRÉS

PURPOSE:

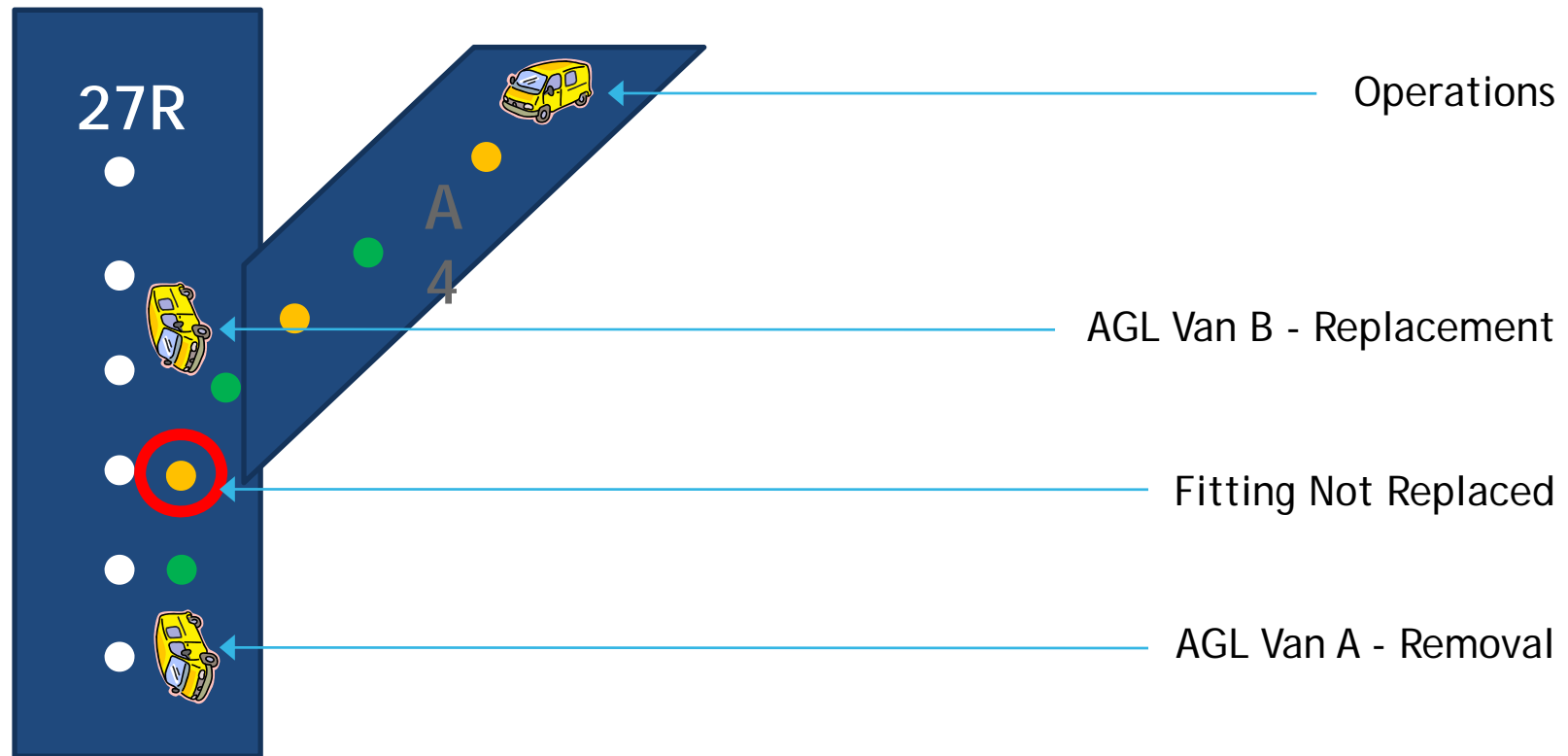
This Safety Alert arises from a recent incident in which a departing air carrier aircraft dislodged an in-pavement runway light fixture, causing significant damage to the aircraft. This CASA reminds

OBJET :

La présente alerte à la sécurité donne suite à un incident récent au cours duquel un aéronef de transport a délogé un feu de piste encastré au décollage et subi des dommages importants. La

Operator must properly maintain lighting systems. This alert is issued by the Civil Aviation Safety Inspector.

Maintenance Airport Incident



Airfield Maintenance

What are the requirements from airports?

Who conducted work in the concerned area, and with which maintenance equipment?

When assets were last checked, and by whom?

Why was no one alerted that something was missing or wrong?

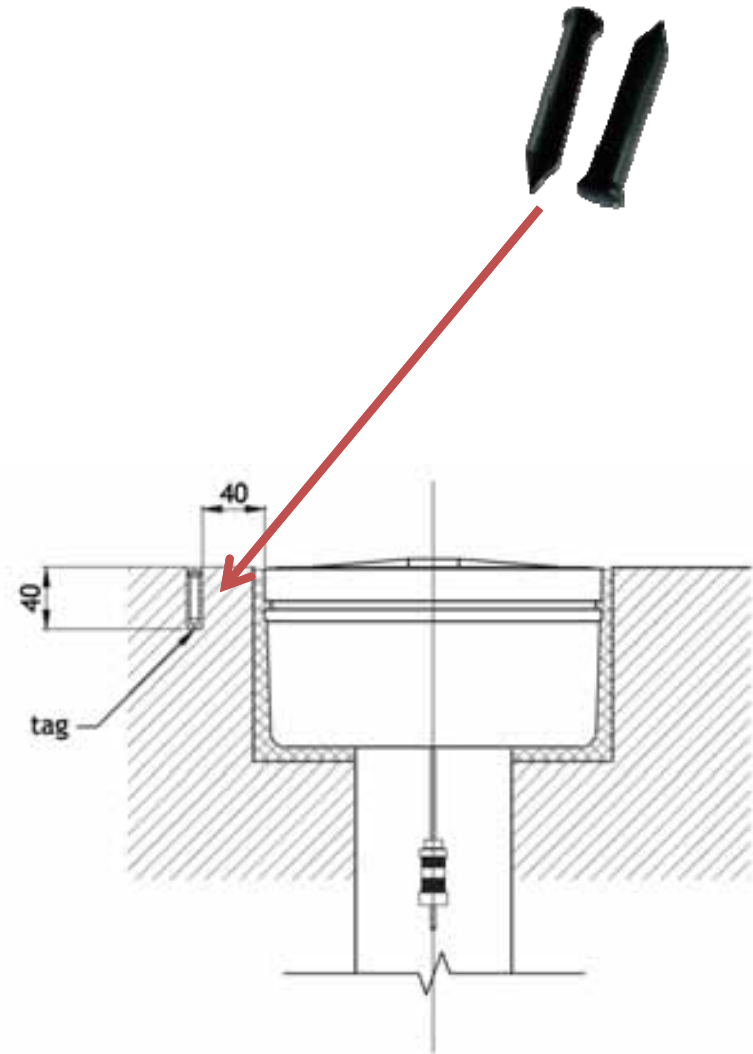
How can we get runway locality awareness and asset identification at night?

How to prove to the business and the authorities that compliant maintenance is performed?

How to avoid doing excess maintenance work?

Asset Management & Maintenance:

1. Install RFID tags next to “Assets”



Asset Management & Maintenance:

2. Conduct Site Survey



All Loaded Assets

Asset ID	Asset Class	RFID Tag	Serial Number	Designation	Manufacturer	Model
1	FRC - R/C	5000DF80F...	000	09L/27R	ADB	FRC
2	FRC - R/C	5000DF853...	000	09L/27R	ADB	FRC
3	FRC - R/C	5000DFEF1...	000	09L/27R	ADB	FRC
4	FRC - R/C	5000DF87A...	000	09L/27R	ADB	FRC
5	FRC - R/C	5000DF68...	000	09L/27R	ADB	FRC
6	FRC - R/C	5000DF522...	000	09L/27R	ADB	FRC
7	FRC - R/C	5000DF41C...	000	09L/27R	ADB	FRC
8	FRC - R/C	5000DF28...	000	09L/27R	ADB	FRC
9	FRC - R/C	5000DF34...	000	09L/27R	ADB	FRC
10	FRC - R/C	5000DF79...	000	09L/27R	ADB	FRC
11	FRC - R/C	58063285F0...	000	09L/27R	ADB	FRC

1 - 20 of 1311 items

Asset Detail (90 Day Cycle day cycle)

Description	Value
Service	Runway Centreline
Direction	Straight
Mounting	81%
Fixing Points	2

1 - 4 of 4 items



Asset Management & Maintenance:

3. Associate RFID tags with GPS Coordinates

The screenshot shows the 'AssetAssignment' mobile application interface. The top status bar displays the time as 12:48 PM. The app title 'AssetAssignment' is at the top left, and a home icon is at the top right. The main form contains the following fields and elements:

- Unit ID:** 5000E068B46C (Annotated as RFID Tag)
- User ID:** ADB
- Date:** 06 Feb 2014 - 12:48:51 PM
- Area:** 113
- GPS Location:** 0° 0' 0.122" N, 0° 0' 0.067" E (Annotated as GPS Coordinate)
- Asset Class:** FTZ - L (Annotated as Associated Asset Type)
- Main Area:** Tuesday (Annotated as Asset Maintenance Area)
- Serial Number:** ---
- Asset Preview:** A small image of a chair (Annotated as Asset Preview)
- Submit:** A button with a checkmark icon.
- Cancel:** A button with an 'X' icon.
- Selection Lock:** A toggle switch.
- Status:** A field.
- Data Count:** 1
- Scan Next Tag:** A button at the bottom.

On the left side, there is a list of 'Asset Type' options with radio buttons:

- FRC - R/C
- FRC - C/C
- FTZ - R
- FTZ - L** (Selected)
- LTS - Y/Y
- LTS - G/G
- Unknown
- Unknown
- LTC - G/G
- FTC - G/G
- ETS - C/C

Asset Management & Maintenance:

4. Upload all Data in the System

Screenshot of data in the system

All Loaded Assets

Asset ID	Asset Class	RFID Tag	Serial Number	Designation	Manufacturer	Model
1	FRC - R/C	5000DF00F...	000	06L/27R	ADB	FRC
2	FRC - R/C	5000DF053...	000	06L/27R	ADB	FRC
3	FRC - R/C	5000DFE1...	000	06L/27R	ADB	FRC
4	FRC - R/C	5000DFB7A...	000	06L/27R	ADB	FRC
5	FRC - R/C	5000DFP68...	000	06L/27R	ADB	FRC
6	FRC - R/C	5000DFP22...	000	06L/27R	ADB	FRC
7	FRC - R/C	5000DF41C...	000	06L/27R	ADB	FRC
8	FRC - R/C	5000DFE24...	000	06L/27R	ADB	FRC
9	FRC - R/C	5000DFE34...	000	06L/27R	ADB	FRC
10	FRC - R/C	5000DFB7S...	000	06L/27R	ADB	FRC
11	FRC - R/C	5B0032B5F0...	000	06L/27R	ADB	FRC


1 - 20 of 1511 items

Asset Detail (90 Day Cycle day cycle)

Description	Value
Service	Runway Centreline
Direction	Straight
Mounting	BN
Fixing Points	2

1 - 4 of 4 items

Asset Location



Asset Management & Maintenance: 5. Set Up System & Deploy

Agree on set up => users => planning => access => reporting

Register User > How User Detail

First Name:

Last Name:

Username:

Password:

Confirm Password:

Email Address:

Access Level: Administrator

Role: Admin

[illegible]

The screenshot displays the 'Available Reports' section of the NetScout Systems interface. It contains two report options:

- Excel Export of Shirk Data:** This option features a 'Data Range for Report' dropdown menu with a calendar icon, and a green 'Request' button.
- PDF Report of Active Shirks:** This option features a 'Data Range for Report' dropdown menu with a calendar icon, and a red 'Request Active Shirks' button.

Asset Management & Maintenance: 5. Webapp



Asset Management & Maintenance: Maintaining the Asset- The Technician's Part

The screenshot shows a mobile application interface for asset management. The main section is titled 'Scheduled Maintenance' and displays a table of maintenance events. The table has columns for date, time, day, and asset details. The data is as follows:

Date	Time	Day	Asset Details
FEB 17	10:42	Sunday	Default Group ALPHA_B87889
FEB 19	10:42	Sunday	Default Group ALPHA_B87456
FEB 20	10:43	Monday	Default Group ALPHA_B87784

On the left side, there is a sidebar with icons for 'Log Off', 'HeatMap', 'Asset Assignment', and 'Settings'. At the bottom, there is a 'Connectivity' section showing 'AirSide Remote Server', 'Torque Wrenches Online', and 'AirSide Local Server'.

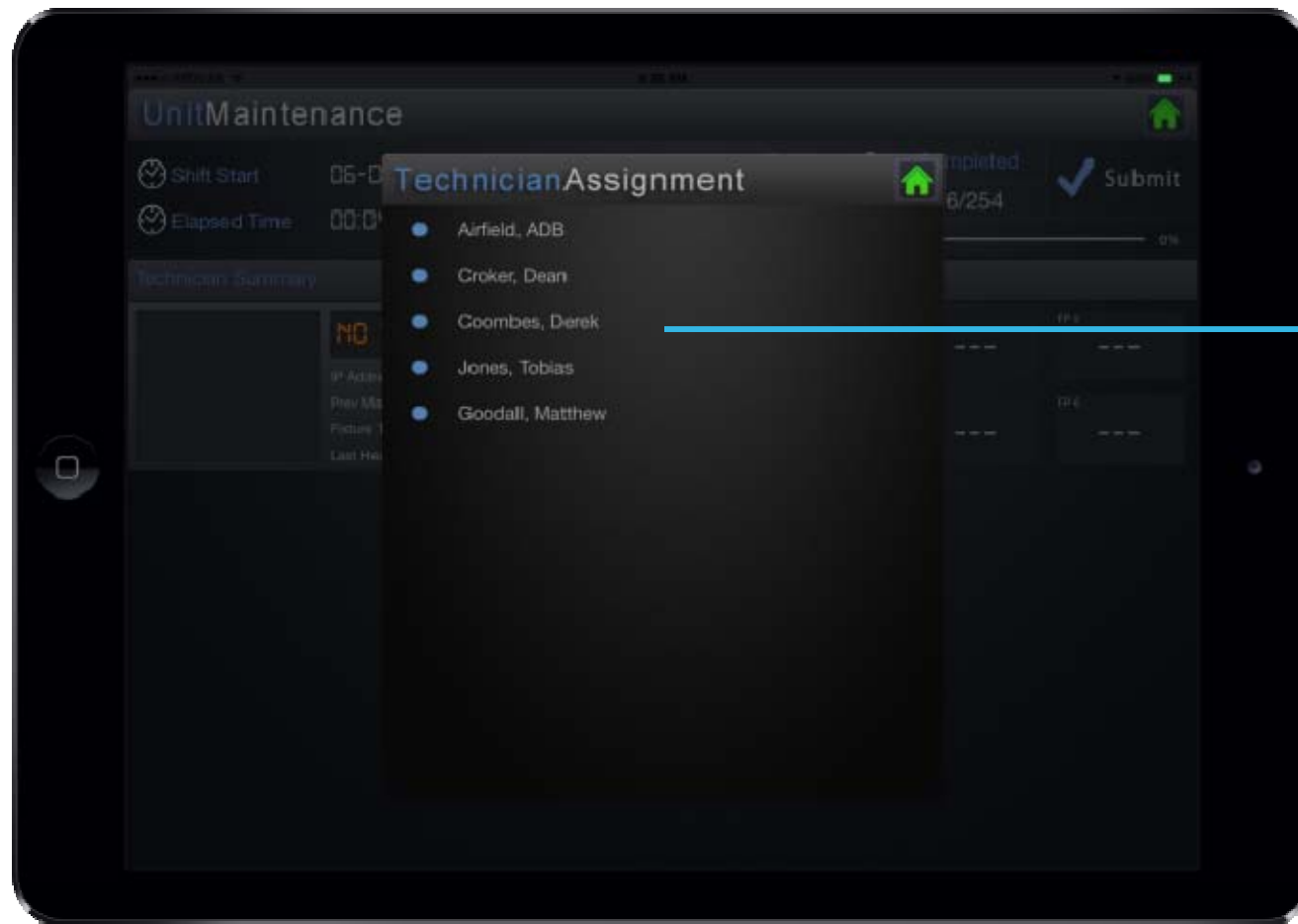
Four blue arrows point from text labels to specific UI elements:

- Arrow 1: Points to the date and time column header, labeled 'Date and maintenance sub area'.
- Arrow 2: Points to the asset details column header, labeled 'Maintenance Area / Technician Group and Permit Number'.
- Arrow 3: Points to the 'Start with the selected shift' button, labeled 'Start with the selected shift'.
- Arrow 4: Points to the 'View assets on a map for location' button, labeled 'View assets on a map for location'.

Asset Management & Maintenance: Maintaining the Asset- The Technician's Part



Asset Management & Maintenance: Maintaining the Asset- Technician and Wrench Association



List of Technicians in
the logged in
technician's group

Asset Management & Maintenance: Maintaining the Asset- The Technician's Part



Asset Management & Maintenance: How it Works- Heatmap in combination with Google Earth



Gives a visual impression of where assets need to be maintained.

Asset Management & Maintenance:

How it works- Viewing Asset Details and Status



Gives a visual impression of where assets need to be maintained.

Clicking on the asset gives a short impression of what, where and status.

Example Shift Scheduling

Shift Schedule

Scheduled Date	Group Name	Maximo Ref	Permit Number	Completed	Area	Sub Area
11/7/2013 11:55:30 PM	Team 1	01AIRSD-A	1234	True	Sunday	19
11/7/2013 11:55:30 PM	Team 1	01AIRSD-A	1234	True	Sunday	19
11/7/2013 11:55:30 PM	Team 1	01AIRSD-A	1234	True	Sunday	19
11/7/2013 11:55:30 PM	Team 1	01AIRSD-A	1234	True	Sunday	19
11/7/2013 11:55:30 PM	Team 1	01AIRSD-A	1234	True	Sunday	19
11/7/2013 11:55:30 PM	Team 1	01AIRSD-A	1234	True	Sunday	19
11/7/2013 4:03:45 PM	Team 1	01AIRSD-A	1234	True	Area 01	105
11/10/2013 9:20:15 PM	Team 2	01AIRSD-B	1234	True	Sunday	19

Example Inspection Documents

Capture Date	Value (Ft-Lbs)	Check Id	Completed	RFID Tag	Asset Class	Model	GPS Latitude	GPS Longitude	Designation
11/8/2013 12:27:57 AM	21.1	2	FALSE	5000E0520BE9	FRC - R/C	FRC	51.47766593	-0.43642239	09L/27R
11/8/2013 12:27:57 AM	22.8	1	FALSE	5000DF75F309	FTZ - L	FTZ-L	51.47754848	-0.43671459	27R
11/8/2013 12:27:57 AM	22	2	FALSE	5000DF75F309	FTZ - L	FTZ-L	51.47754848	-0.43671459	27R
11/8/2013 12:27:57 AM	22.1	1	FALSE	5000E0195DF4	FTZ - L	FTZ-L	51.47753464	-0.43671471	27R
11/8/2013 12:27:57 AM	22.3	2	FALSE	5000E0195DF4	FTZ - L	FTZ-L	51.47753464	-0.43671471	27R
11/8/2013 12:27:57 AM	22.8	1	FALSE	5000DF892620	FTZ - L	FTZ-L	51.47752138	-0.43671471	27R
11/8/2013 12:27:57 AM	21.6	2	FALSE	5000DF892620	FTZ - L	FTZ-L	51.47752138	-0.43671471	27R
11/8/2013 12:27:57 AM	21	1	FALSE	5000E03DF67B	FTZ - L	FTZ-L	51.4775618	-0.43671489	27R
11/8/2013 12:27:57 AM	22.5	2	FALSE	5000E03DF67B	FTZ - L	FTZ-L	51.4775618	-0.43671489	27R
11/8/2013 12:27:57 AM	22.2	1	FALSE	5000DFDB95C1	FRC - R/C	FRC	51.47766463	-0.43685461	09L/27R
11/8/2013 12:27:57 AM	21.4	2	FALSE	5000DFDB95C1	FRC - R/C	FRC	51.47766463	-0.43685461	09L/27R
11/8/2013 12:29:47 AM	20.7	1	FALSE	5000E0520BE9	FRC - R/C	FRC	51.47766593	-0.43642239	09L/27R
11/8/2013 12:29:47 AM	21.1	2	FALSE	5000E0520BE9	FRC - R/C	FRC	51.47766593	-0.43642239	09L/27R

Conclusion

- New regulatory requirements for torqueing in-pavement bolts may pose new challenges for maintenance personnel
- Airports may need to consider challenges such as:
 - Minimizing resources needed
 - Scheduling resources
 - Tracking and recording asset data

**Thank You for the Opportunity to Discuss
Torqueing Procedure Improvement
Methods**

Questions?

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