



FOD PREVENTION PROGRAM



Information Training for visitors of Polskie Zakłady Lotnicze Sp. z o.o. „The document does not contain technical data regulated by ITAR or EAR”

FOREIGN OBJECT DAMAGE PREVENTION PROGRAM

Presentation describes Foreign Object Damage (FOD) prevention program which is obligatory in Polskie Zakłady Lotnicze Sp. z o.o.

OBJECTIVE: To deliver products free from FOD!

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Foreign Object Damage prevention means:

- ✓ Product safety – to avoid life or health threat
- ✓ Costs – of warranty, defects, corrections, unpredictable service costs
- ✓ Customers exoectations/ requirements – not to dissapoint Customer's trust and to win another satisfied Customers

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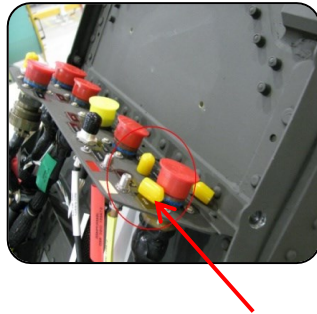


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FO (Foreign Object)



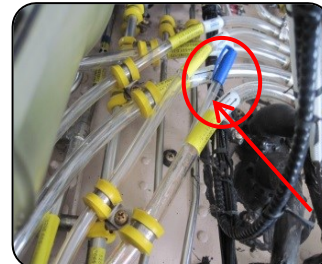
Any object, wicth regardless of its composition and initial intended purpose, is not located in its intanded place and may cause damage of the product.



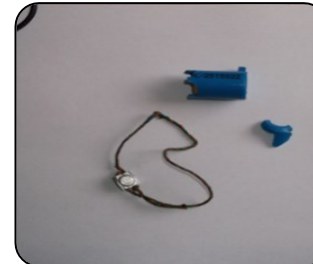
Loose hole plugs in cocpit structue



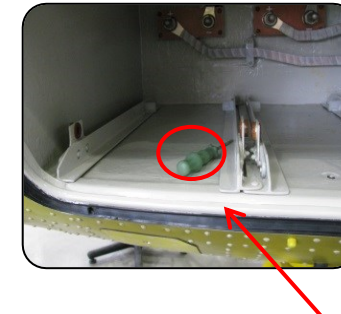
Wire in fuse box



Pen in upper front control area.



Foreign objects on airfield maouvering area



Tool left in aircraft hatch

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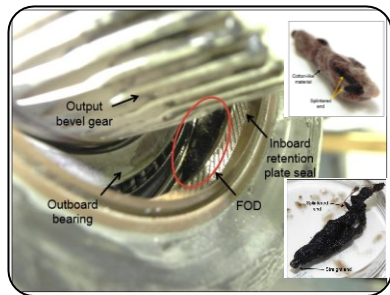
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FOD (Foreign Object Damage)



Damage caused by foreign objects witch deteriorates physical parameters of the products and creates hazard to its safety



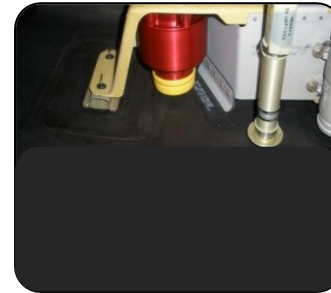
Cotton swab left inside the tail rotor gearbox



Loose sleeve left by manufacturer in helicopter door



Material delamination inside helicopter ventilation channel



Hole plug left in helicopter fuel tank



Spring detected in filling indicator of the main gear



Aircraft damage caused by bird

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FOD zones in production areas!



The highest risk of FOD is encountered in areas connected with tests and flights of aircraft (hangar, apron) and in final assembly areas where final closing of chambers takes place.



High risk of transferring FOD to final product is encountered in assembly areas where chambers are present.



Low risk of FOD: all production areas not designated as Critical or Control Zone .



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Requirements in FOD critical zone

- ✓ Rigorous monitoring of entrance
- ✓ Admittance after FOD training or accompanied by authorized employees
- ✓ No unnecessary personal things
- ✓ Aproppiate work uniforms
- ✓ Supervision over standard parts and consumables
- ✓ Control of tools
- ✓ Immediate reporting of lost objects
- ✓ No eating
- ✓ Keeping things in order



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Szkolenie informacyjne dla kontraktorów Polskich Zakładów Lotniczych Sp. z o.o.

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Requirements in FOD control zone

- ✓ Monitoring of entrance
- ✓ Admittance after FOD training or accompanied by authorized employees
- ✓ Supervision over personal stuff, standard parts and consumables
- ✓ Control of tools
- ✓ Reporting of lost objects
- ✓ No eating
- ✓ Keeping things in order



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Requirements in FOD consciousness zone

- ✓ Admittance after FOD training or accompanied by authorized employees
- ✓ Keeping things in order
- ✓ No eating
- ✓ Reporting of lost objects



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FOD RULES

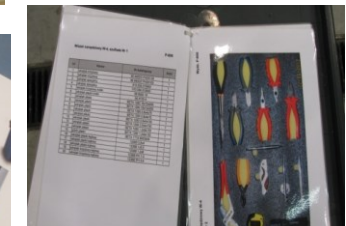
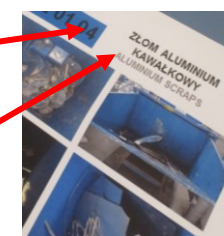
Fundamental principles of FOD prevention program were based on work organization improvement with use of visual inspections and 5S tools, i.e.:

- (Seiri) Sort
- (Seiton) Set in order
- (Seiso) Sweep
- (Seikesu) Standardize
- (Shitsuke) Self discipline resulting in positive influence on FOD prevention and work safety

IMPORTANT:

All individuals staying in Polskie Zakłady Lotnicze Sp. z o.o. are obliged to observe the above specified principles

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Keeping things in order

Tidy working area is the most effectice FOD prevention indicator

Clean after yourself:

- ✓ When you leave your working stand
- ✓ In your free time
- ✓ At the end of the shift
- ✓ When you finished your task

Use FOD containers for production waste

If you see something is dropped – PICK IT UP,
don't let it become FOD

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Tool's state controll

Check the state of tools – are they clean, damaged or broken, is their quality level appropable for a given task

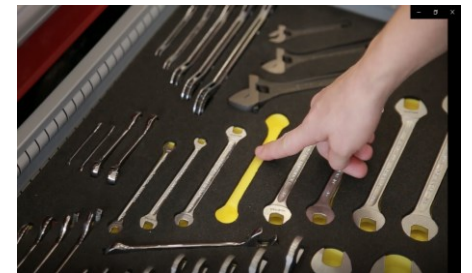
In the work area only necessary tools, by technological standard, should be used

Confirm quantity of tools at the end of the shift and assess the state of tools in the personal toolboxes.

In case any tool is missing – [inform the master about this fact immedatly](#).

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Personal stuff

Even ordinary pen may block flight control systems or cause short circuit of electric system. That's why never bring unnecessary personal belongings into production area. These which are indispensable store in special bags or zipped pockets of clothes and uniforms.

Before entering critical zone leave all unnecessary objects in a cabinet intended for this purpose



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Flight related operations

Operations executed in vicinity of helicopters or aircraft are always dangerous due to large engine energy and strong air stream generated by rotor blades

Every one has a duty to minimize risk !!!

- ✓ Observe all principles related to flight area
- ✓ Pick up and remove foreign objects
- ✓ Immediately report any dangerous conditions
- ✓ Inspect vehicles for presence of foreign objects before entering flight area
- ✓ Before entering flight area make sure that objects are secured, boxes/containers are closed, equipment is firmly fixed on vehicles

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Why FOD prevention is so important!

This compressor was damaged during engine tests. Damage was caused by a piece of asphaltic concrete detached from the substrate. Luckily, damage was minor and replacement of parts was not necessary. A number of preventive actions were undertaken to eliminate similar accidents.



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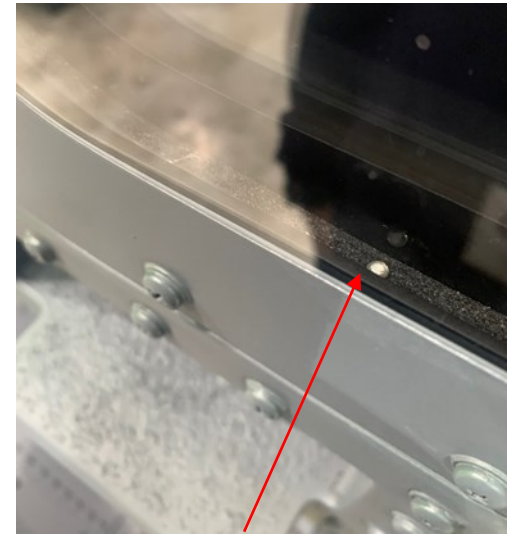
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Inspection (Detection) as a part of Clean as you go

After task completion, notify the QC inspector to perform detection as the final acceptance authority.

Small circular piece of leather that have been missed or the screw pushed it out and may have come loose during flight tests.

Found object had little to no impact on safety risk, though it had severe impact on delivery time, since the object had to be removed.



A piece of leather from the upholstery

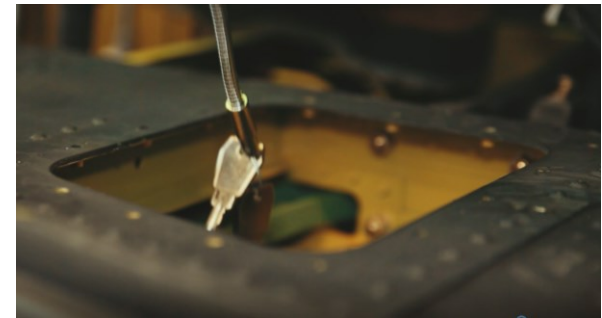
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WHY FOD PREVENTION PROGRAMM IS SO IMPORTANT

- ✓ Prevents the damage on final product.
- ✓ Eliminating FOD is a legal requirement that has the key effect on company's reputation
- ✓ Effective FOD programm can identify potential problems, helps to remove causes, improves consciousness and procides right training for a continuous improvement of a FOD essence understandment.



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SUMMARY

FOD may result in damage, major injury or death, it costs aviation companies billions of dollars ...

And is in 99% possible to prevent ...

Every employee is responsible for delivering safe products free from foreign objects.

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PZL MIELEC

A LOCKHEED MARTIN COMPANY