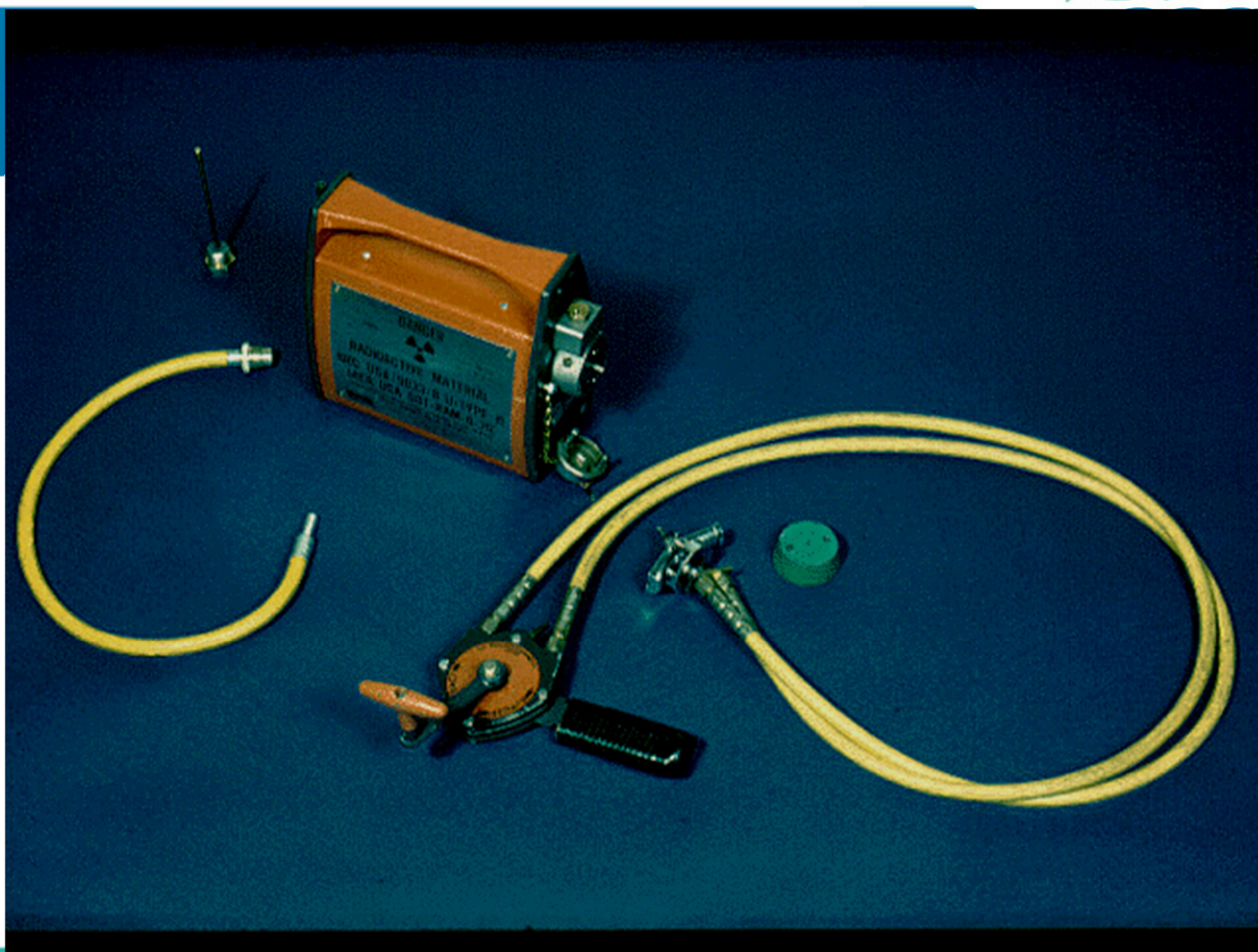
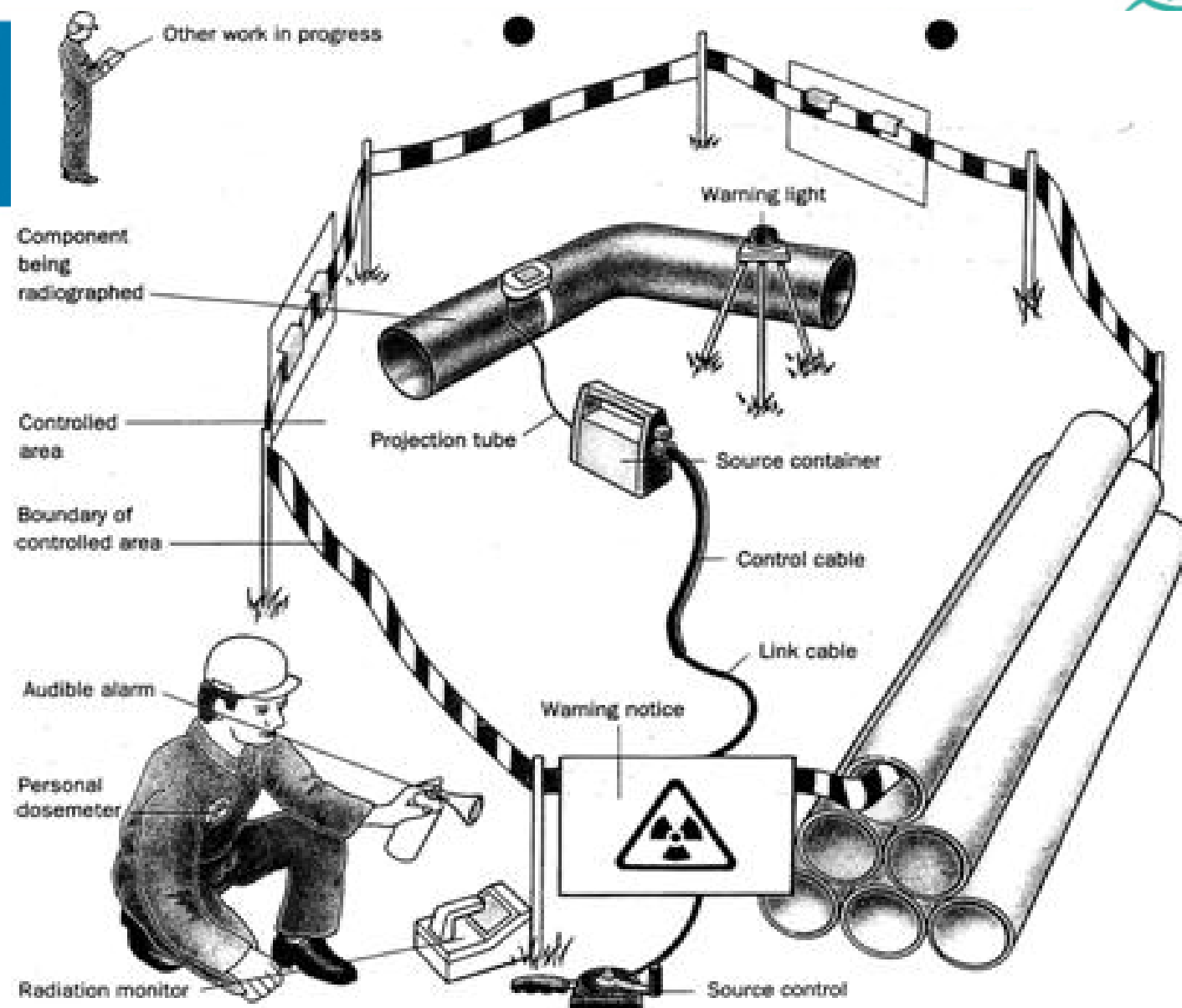


NDT Incident



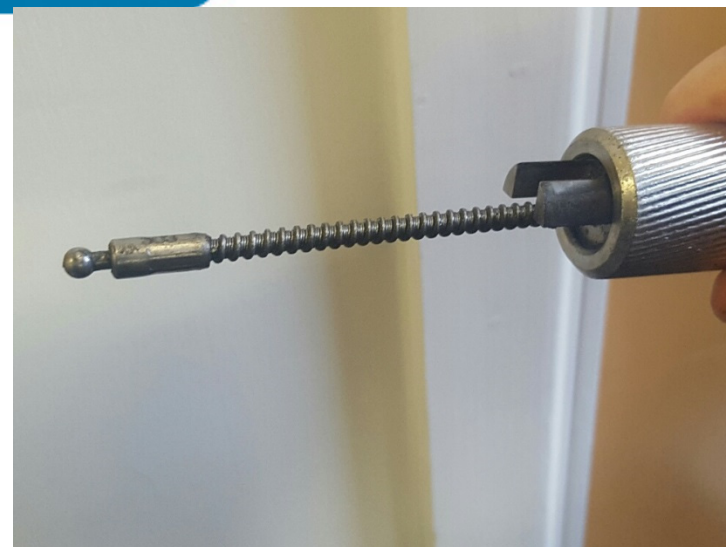
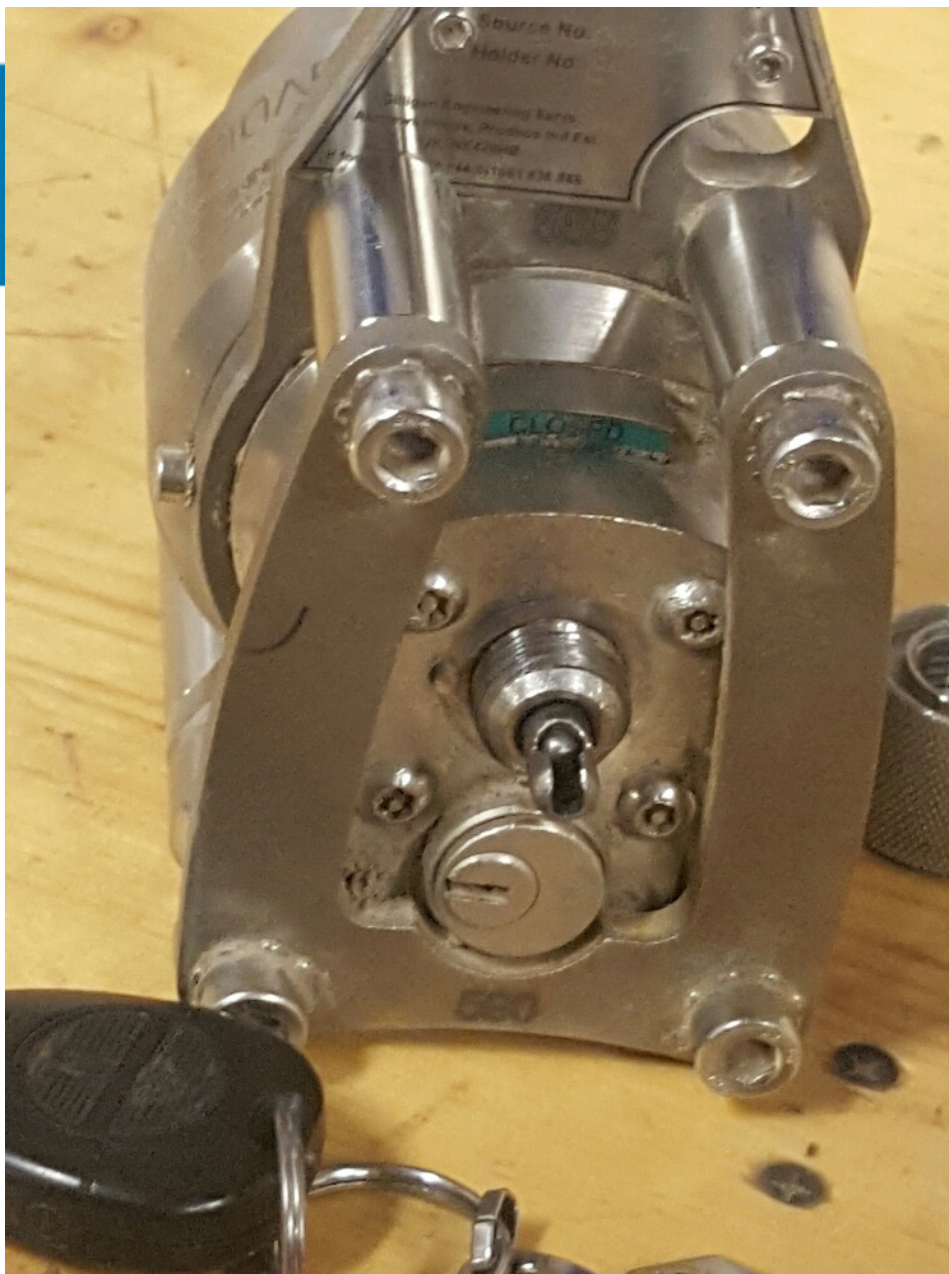


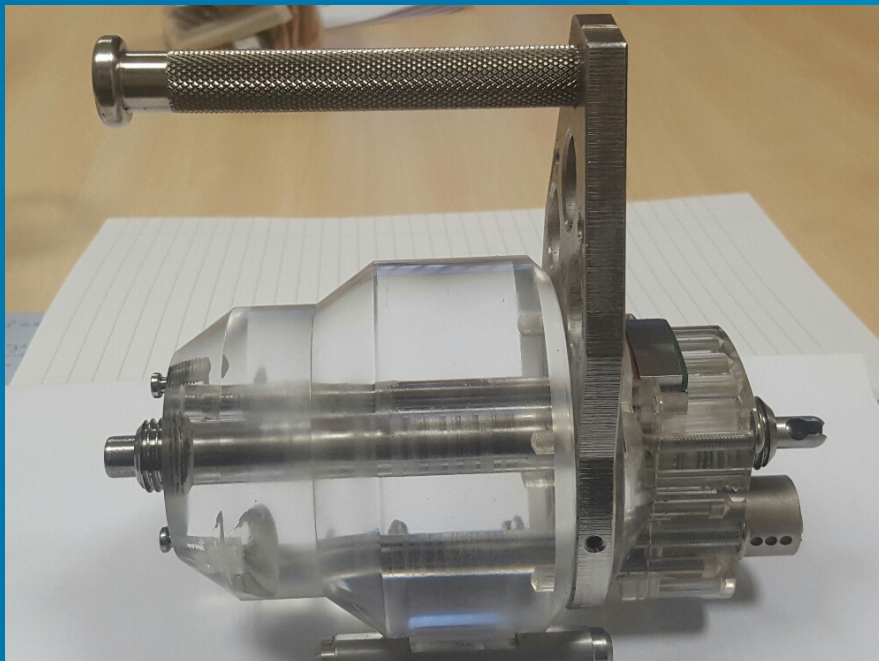














SAFE TO APPROCH

GREEN CLOSED position indicates that Source holder is inside Container and **LOCKED** in Position



UNSAFE TO APPROCH

RED OPEN position indicates that the Source holder is **NOT LOCKED** inside the Container

Incident details

- Date of incident: Jan 25th 2017 Source Se-75 13.8 Ci;
- Incident reported to the EPA on Jan 26th.
- Following site radiography Crew member A's alarming EPD activated following the disconnection of the wind-out and guide-tube from the projector.
- Crew Member B noticed that the automatic locking mechanism of the projector was indicating RED ie the source assembly was not secure. It was assumed that the source had shifted to the unshielded adaptor
- Projector was moved to a safe location, the exclusion area was re-erected and the RPO was contacted regarding source retrieval procedure
- It became apparent from dose rate readings that the source had fallen out of the projector/adaptor and its exact presence was quickly determined.

Incident Details

- Crew member B eventually managed to reattach the drive cable of the wind-out to the connector on the pig tail-end of the source assembly, and retracted the source assembly back into the projector. However, it took several attempts of rapid “short winding out and retracting of the source” movements before the locking mechanism was activated indicating that the source was secure in the projector.
- The EPD readings for the two crew members were 28 μSv (crew member A) and 101 μSv (crew member B) respectively indicating that no significant radiation doses were received by the crew members.

EPA Follow up

- Report into incident requested from NDT company (Jan 25th)
- Source projector manufacture notified of the incident (Jan 26th)
 - Requested to forward operator's manual for the projector
- EPA inspectors visited NDT company (Jan 27th)
- All Licensees prohibited from using source projector (Jan 30th)
- Further distribution of source projector was prohibited in Ireland (Jan 30th)
- NIEA advised of the incident with the projector (Jan 30th)

Incident Follow up

- Source manufacturer met with EPA (Jan 31st)
 - Demonstrated safety procedures of the projector with a Perspex model and dummy source assembly
 - Full maintenance history of projector provided
 - Manufacturer believe that their engineered solution prevents the disconnection of the inner drive cable when the source is not secured in the container
 - Drive Cable disconnection is possible by holding the end of the source assembly thereby preventing it from moving into the container
 - Manufacturer of the view that operator error was the cause of the source falling out of the projector.
 - EPA's view was that design of the projector contributed to the incident

1



To disconnect the Windout Connector from the Source Holder you need to move the connector forward towards the SPS [REDACTED] unit and the connector pulled from the source holder when in the 90 deg orientation

2



If the Lock is in the **RED OPEN** position, then 2 things are evident

1. The Lock Status Indicator is directly in front of the Operator in this position
2. The Source Holder will not be locked and therefore move freely towards the [REDACTED] unit. This prevents the Operator from being able to incline the connector to the 90 deg position for removal

2



Free movement Indicates Source is **NOT LOCKED** and therefore the lock is in the **RED OPEN** position

Both above should be sufficient to indicate to the Operator that it is unsafe to remove the Connector

EPA Follow up

- Technical Examination of the projector took place at the Manufacturer's headquarters on Feb 6th 2017.
- Automatic locking Mechanism difficult to activate
 - Bend in Inner drive cable of the wind out assembly
 - Ingress of dirt into the locking mechanism of the unit
- Locking mechanism worked perfectly why stripped down cleaned and lubricated
- The Manufacturer Concluded:
 - Ingress of dirt caused the ALM to malfunction
 - If SOP followed for disconnection then it should not have been possible for the source assembly to have fallen on the ground.



Findings

The automatic locking mechanism on the projector was failing due to most likely the excess of dirt that had accumulated within the locking mechanism. This dirt would have caused an increase in friction that could not be overcome by the wind-out.

The safety features of the Projector are susceptible to the ingress of dirt and soil which may prevent them from performing their intended function.

NDT staff were carrying out a disconnection procedure at variance with that contained in the Operators Manual, but similar to the procedure used in the old Techops Units or Sentinel Units manufactured by QSA.

Findings cond,t

- Training of operators in the specific use of the Projector and in source recovery procedures for reasonably foreseeable accident or incidents during routine use both by the licensed user and/or the manufacturer needs to be improved.
- The Operators Manual would benefit greatly from clear bulleted instructions or steps for disconnection including photographs of the process and the inclusion of a list of reasonably foreseeable accidents/incidents that can occur during routine operation together with the Manufacturers guidance on how to deal with them.
- It was relatively easy for the operator to overcome the manufacturer's engineered solution designed to prevent the wind-out drive cable from separating from the pig-tail with the Projector indicating RED.

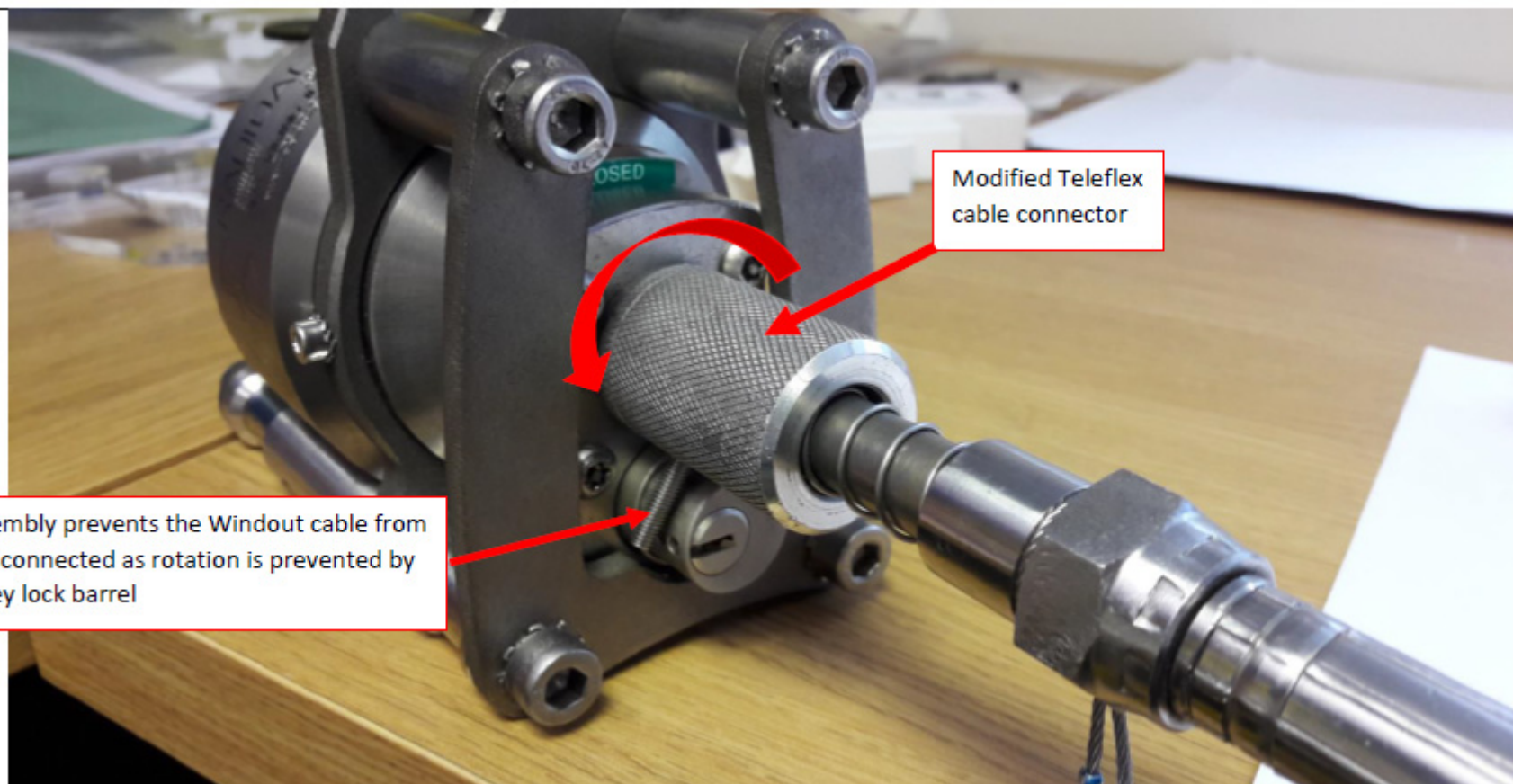
Actions



- NDT Licence conditions are to be upgraded to include a condition for mandatory operator training in the specific use of the licensed Projector and in source recovery procedures for reasonably foreseeable accident or incidents during routine use.
- Operators Manual is to be upgraded to include clear bulleted instructions or steps for the connection and disconnection of the accessories including photographs of the process and to include a list of reasonably foreseeable accidents/incidents that can occur during routine operation together with the Manufacturers guidance on how to deal with them.

Actions cond't

- As demonstrated by this incident the Projectors can be used in different and disparate environments which can result in the ingress of dirt and soil and thereby may compromise the safety features of the unit, in particular the automatic locking mechanism.
- The manufacturer is to review their maintenance programmes for the Projector and determine what additional measures can be taken by the operators or the manufacturer to minimise this occurrence and implement them.



Actions cond't

- The ease of overcoming the manufacturer's engineered solution designed to prevent the wind-out drive cable from separating from the pig-tail with the Projector indicating RED is considered to be a design fault that could and has put people at risk.
 - The manufacturer is to consider what design change is required in order to prevent this incident from re-occurring and implement it.
- The licence restriction on the use of these Projectors is to remain in place for NDT licensees until further notice, and likewise the restriction on the distribution of this type of Projector is to remain in place until further notice.