



# Automating Dose Badge Distribution Tracking

*To save time, money and accurately track doses*

## Project Background

By law any individual working with/around ionising radiation must wear a Thermoluminescent Dosimeter (TLD). These TLDs once processed show how much radiation an individual has been exposed to over a period of time. On average these TLDs are changed bi-monthly and sent off to be processed. If one of these TLDs are not returned within the specified time period, the department responsible for returning the TLD is fined £31.80. In large departments it is possible that a significant number of these TLDs are not returned by individuals, resulting in a large fine to be paid by the department. To counter this a system whereby the exchanging of these TLDs could be monitored, was needed.

## Project Aims

- Reduce the Number of Unreturned TLDs by Radiographers
- Reduce the Time spent by Radiographers Sorting TLDs
- Accurately Track Timings of Returns to Aid Dose Breach Investigations

## Method

Over a 14 month period the spreadsheet was used to track the exchange of TLDs by individuals working in the University Hospital of Wales Radiology department. This study included a cohort of 92 Radiologists, 93 Radiographers and 41 Radiology Department Practitioners (RDAs). At the end of the study the data from the spreadsheet was compared against the official return statistics provided by RPS Velindre to assess whether the number of TLDs scanned into the spreadsheet impacted the total number of TLDs returned.



Figure 1. Example of TLD

	30/04/2021	30/06/2021	31/08/2021	31/10/2021	31/12/2021	28/02/2022	30/04/2022	30/06/2022
NOT SCANNED	8	4	15	17	17	5	8	14
NOT RETURNED	0	0	4	0	4	2	2	1
RETURNED	67	71	70	67	67	81	74	58
TOTAL EXPECTED	75	75	85	84	84	86	82	72

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Figure 3. Example of User interface

## Project Outcomes

The data shows that the percentage of unreturned badges is closely linked to the number of TLDs not scanned into the spreadsheet. The greater the percentage of TLDs scanned the higher the percentage of returns.

On the other hand the data suggests that this system has not improved the overall return rate of TLDs within the department.

When analysing the fine reports from RPS Velindre the fines to the department for Radiographer TLDs has dropped by nearly £400

## Project Impact

The overall impact of this project has been a decrease in fines paid by the department, a decrease in radiographer time taken to arrange and log the TLDs and increase awareness of the importance of returning TLDs on time.

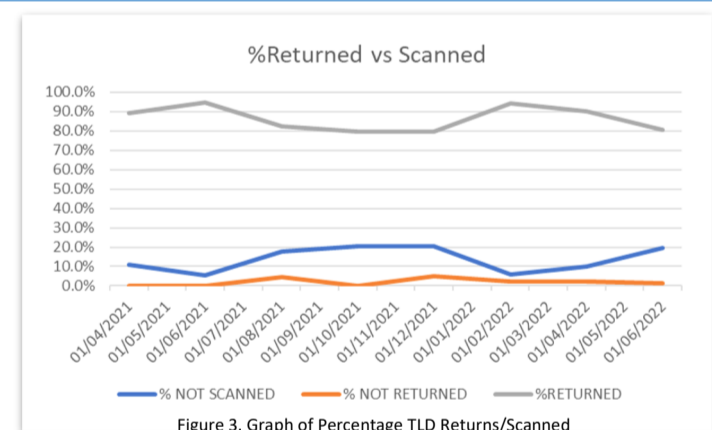


Figure 3. Graph of Percentage TLD Returns/Scanned

## Project Conclusions

Logging TLD exchanges has shown to positively impact the rate of TLD exchange. However, the lack of interaction with the spreadsheet has meant that the rate of TLD has fluctuated throughout the monitored period.

Despite the fluctuations the 6 monthly fines have dropped from a maximum of £733 to a low of £237. If this trend continues along with an increased interaction with the system then there is potential for these fines to reduce even further.

## Next Steps

The next steps with this project are firstly to automate it further by implementing automatic email reminders to those who are flagged up as having not exchanged their TLD. Secondly, the aim is to convert this spreadsheet into a free standing desktop application. Finally, this system will eventually be on a linked server so that individuals can access it through any workstation within the department.