DEAR DGA....

Recently DGA Group held a couple of webinars on the "Dark Arts of Delay Analysis", where David Waddle and David Aldridge sought both to "shine a light" on what people often consider to be a "black box" where there is little transparency and give some useful, practical, advice.

Over the next couple of E-Briefs, we will touch on some questions from our talks and mention some of the problems faced by our clients.

Question: 'What is float, how does it arise, and how is it dealt with in a programme/ delay analysis?'

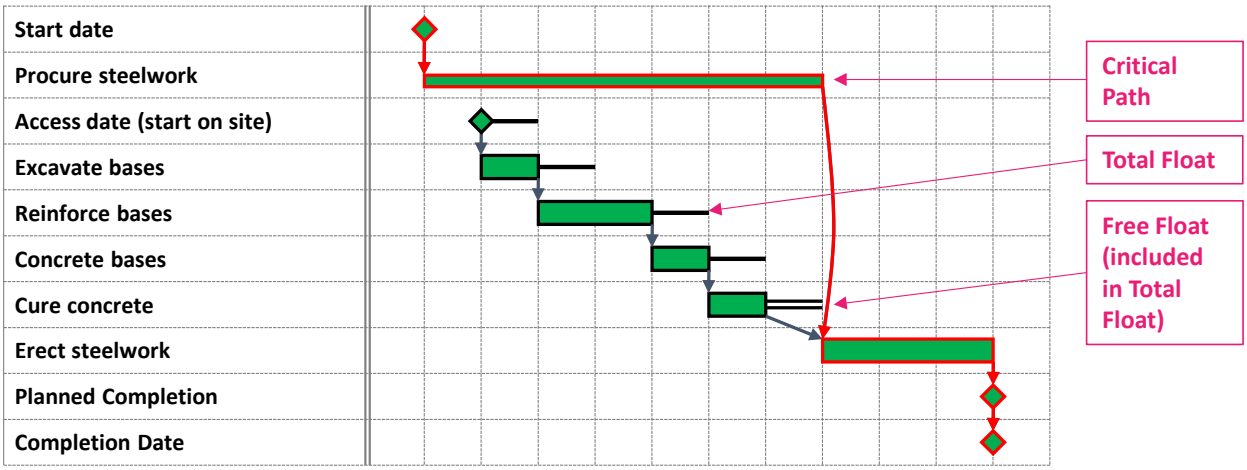
ANSWERED BY:

DAVID ALDRIDGE, GROUP HEAD OF PLANNING

WHAT IS FLOAT?

Float generally occurs where a number of activity sequences are set to run parallel, with differing timescales, so one or more activity path finishes earlier than another. The path that finishes earlier can potentially be delayed without causing a "critical delay" to the project.

In the simplistic graphic below, there are two "activity" paths, kicked off by different events, both of which need to be completed prior to the start of steel erection on site:



It is evident that, as planned, the "procurement task" (kicked off by an instruction to start work) is driving the longest path to completion (the "critical path"), while the civils activities (kicked off by the site access date) have a week of "float" by comparison. In effect, any one of the civils activities could be delayed by up to a week, without that affecting the start of the steelwork erection activity.

There are two main types of float people refer to:

- "Free Float" is the amount an activity can be late before it impacts on the next activity in the sequence. The "cure concrete" activity has some "free float".
- "Total Float" is the amount an activity can be late before that lateness starts to impact on the overall critical path for the job. In this example, because the concrete curing has a week of "free float", each of its predecessors also has "total float". A delay to these earlier activities will cause a delay to subsequent civils work sequence activities, but will not cause a delay to "Completion" (unless the delay is greater than 1 week).

In most scenarios, when people talk about float, they mean the activity's "total float" (often because they are seeking to establish the correct Extension of Time ("EOT")). However, any delay (even one only using up "free float") can have a number of other potential effects, including:

- An increase to the project's risk profile (associated with the later timing of that activity).
- Delays to that activity, as well as to other subsequent tasks (which may also have their own float), and the (disruptive) replanning and change work necessarily involved.
- Other impacts such as additional cost arising from the disruptive delay (even if that delay is not critical to the overall project).

For example, if there were a site access delay, in the example above:

- Access being delayed by a week is not immediately likely to cause a "critical delay".
- However, there will be direct delays to the main affected activity (for example, a week of "standing time" for the groundwork subcontractor and its resources, if the subcontractor had organised to attend site from week 2, and could not find other useful work to do).
- There are likely to be "knock-on" delays to subsequent activities (and the relevant subcontractors), albeit with reducing impact severity over time.
- There are likely to be direct impacts on the Contractor's management processes, is it will have to manage the delay, and the disruptive effects of that delay (to the groundworker, and the subsequent reinforcement and concreting teams, etc.).

It should be evident, therefore, that delay does not need to be "critical" for the measurement and analysis of delay to be important. It is useful to identify, and assess, even simple "changes in float".

PROBLEMS THAT MAY ARISE BECAUSE OF FLOAT

Issues we regularly face include: "What kind of analysis is best?" and "How best can we carry out that analysis?" In relation to float, these can be key questions, as there may be doubt as to the viability of the baseline programme and whether it may need to be changed or adjusted before any delay analysis can be sensibly carried out.

One of the common issues we see, in this regard, is a poorly prepared construction programme, with minimal (or erroneous) links, which contains a significant amount of problematic "float".

For some delays and forms of analysis, this may not be a problem, perhaps because of the timing of the event being claimed. One only needs a "static" programme (not fully "logic linked", or where the logic links are poor) for certain forms of retrospective "As-Planned vs As-Built" ("APvAB") analysis. A relatively simplistic claim analysis might consider the programmes and identify that:

- The main building piling works must have been on the critical path of the works (as no other activities were ongoing at the same time).
- The piling works were planned to take 6 weeks.
- The piling works actually took 10 weeks.
- So... there was a 4 week "critical delay" in the Piling works.

A detailed examination of the facts may then clearly determine the reasons for these 4 weeks of piling delay, perhaps because:

- There were problems encountered with hard rock in the ground, coupled with...
- The piling design being changed to require deeper piles which hit the hard rock.

In such a scenario, the claim (and the evidence for that claim) is relatively simple to process.

However, in a more complex project, it may not be evident that piling was on the critical path, or it may have had some "float". Other (parallel) activities may have been suffering similar, or greater, delay. As a result, the simplistic analysis above is unlikely to generate a valid EOT claim, or may not find favour. Other forms of analysis may be needed, to explain and clearly demonstrate the amount of critical delay caused by the piling.

The form of contract may also militate against such an analysis (with the NEC form requiring a more detailed, and "programmatic" assessment of the impact of the event on the planned programme extant at the time of the delay).

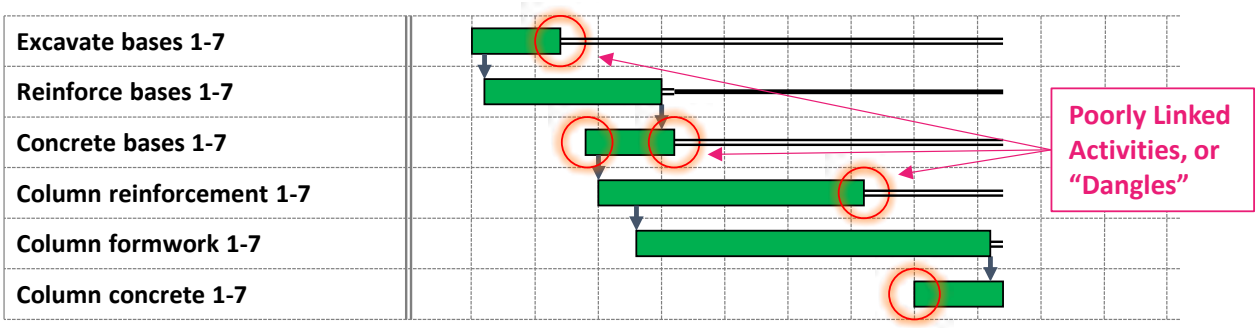
"FLOAT" IN A "BASELINE PROGRAMME"

The more detailed forms of analysis generally start with an assessment of the "baseline programme", but it is my observation that few contractors give this important task sufficient regard. In my view, the base contract or construction programme should be constructed with care and attention, with the contractor considering (in some detail) the activities and timescales needed, and any programme produced being backed up by a detailed Method Statement that explains it.

Unfortunately, however, when brought into a project late on, we often find poorly prepared baseline and update programmes, which contain problematic "float". This can be a particular issue in complex programmes, even if prepared by an experienced planner (though we often find that the programming task is left to the Project Manager, or a member of his team, who may not have a planner's experience or skills).

It is vital, therefore, to check and ensure that a programme to be used for dynamic analysis is "suitable and sufficient" to show delay, and that (in particular) the potential activity sequences affected by the delays being experienced can be demonstrated through the programme.

Take the following sequence, for example, where the activities have some linking, but also contain "dangles":



- While the reinforcement task is "driven" by a start of excavation (with a short "lag"), there is no completion link leading out from that activity, which gives it "Free Float" (illustrated here as the double black line to the right of the activity).
- As a result, "in the programme" the excavation task may start, and then get delayed significantly, without that showing an "impact" on subsequent civils works activities.

Such "shorthand" is very common in construction programmes, as the person doing the planning is often given limited time or resource, and they simply try to show a "reasonable" activity sequence with the smallest amount of effort (i.e. by minimising, or not properly considering, the reality behind the links to be included). Such "shorthand" can be dangerous to later claims.

As such, because most programmes contain some errors, and poorly planned programmes often contain many or significant "errors", one first step in any consideration of a programme for delay analysis is to examine the baseline programme and "correct" it (where necessary).

Of course, "correcting" a programme can also be contentious process in its own right. The consideration and management of such a process should be treated with caution and discussed with a delay expert, such as DGA (along with your other professional advisors). Programme changes will almost certainly be "disputed" by another party who wants to refuse a claim, so it is much better to get the programme right in the first place!

It is our recommendation that, when starting into any significant project, and at a very early stage, you carry out a "3rd party review" of the planning and programming undertaken with someone like DGA, at an early point (either before submission of your first programme, or before any disputes are indicated).

In any event, the reasonability of a programme, including any float it has, needs to be considered before moving into any form of detailed delay analysis.

THE OWNERSHIP OF FLOAT

An important question which comes up regularly about "float", is who "owns" it.

"Ownership" can be tricky, but it seems to be established law that, in the main, ownership belongs to whoever uses it first. For example:

- If an Employer delays an activity in float, causing it to "use up the float" and become "similarly critical" to completion, that is unlikely to generate any overall EOT claim.
- If the Contractor then causes a further delay, and that delays completion, he is unlikely to have a good claim, even though the Employer's delay occurred first.

In one case I have been involved in recently, a key "Material Required By" date for some Employer Free-Issue Materials was not clearly (or effectively) linked into subsequent activities (which were also not well linked). Under the NEC form, the Contractor has had difficulty properly and clearly demonstrating the cause and effect impacts from the late provision of those materials.

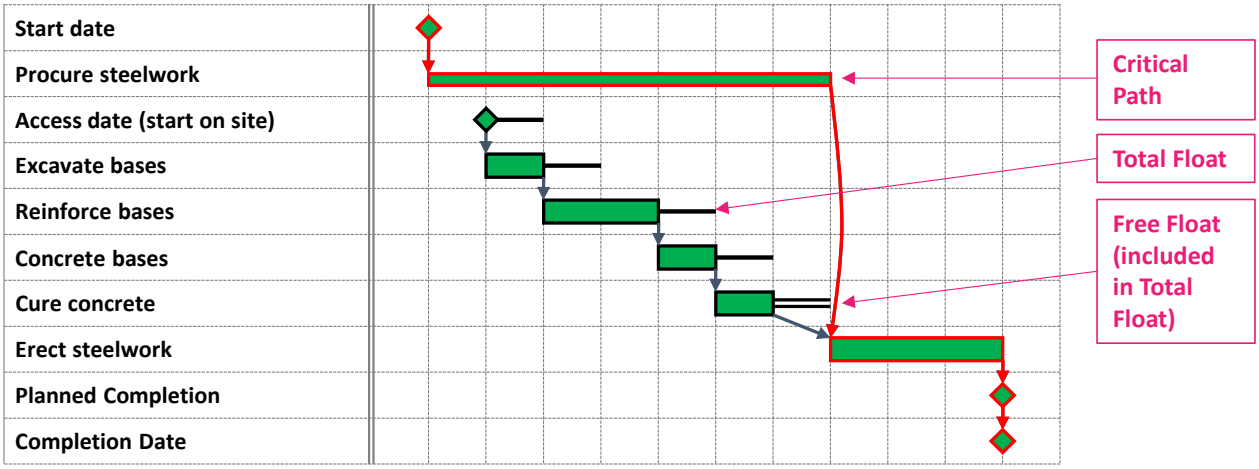
The management of these "clear risks" from float, and how float is shown on the programme, varies depending on the project, the type of contract under which the programme is used and examined, and the differing forms of analysis that may be required. I obviously do not have time to consider all the issues in this article.

MANAGING FLOAT IN A BASELINE

From the above, it should be evident that float often does exist in a programme. As such, a first step in considering delay is to examine that programme in the context of the Contract so as to consider what one is likely to need to determine and explain, when making a claim. For example:

- JCT contracts usually require an assessment of whether a delay has, or is likely to, cause a delay to Completion. The assessment need not (necessarily) involve a full, detailed, programme analysis (though is more likely to be acceptable if it does).
- The NEC, in contrast, sets out a highly detailed and specific analysis process, under which the parties are required to consider and identify, based on the last Accepted programme, the delay caused to "Planned Completion".

A good (well thought out) programme by a contractor can make a significant difference to the outcome in either case. Going back to my original example sequence, in which the period grid was measured in "weeks":



The 5 weeks of civil works activities are seen to have a week of float, generated by the elongated (7 week) procurement period for the steelwork. That may well be realistic, but if there is a delay to the civil activities (for example, a delay in access, or a prolonged excavation due to ground conditions) which causes a week's delay, the presence of "float" means it may not generate any claim for EOT (though of course, a claim for the direct costs would still be possible).

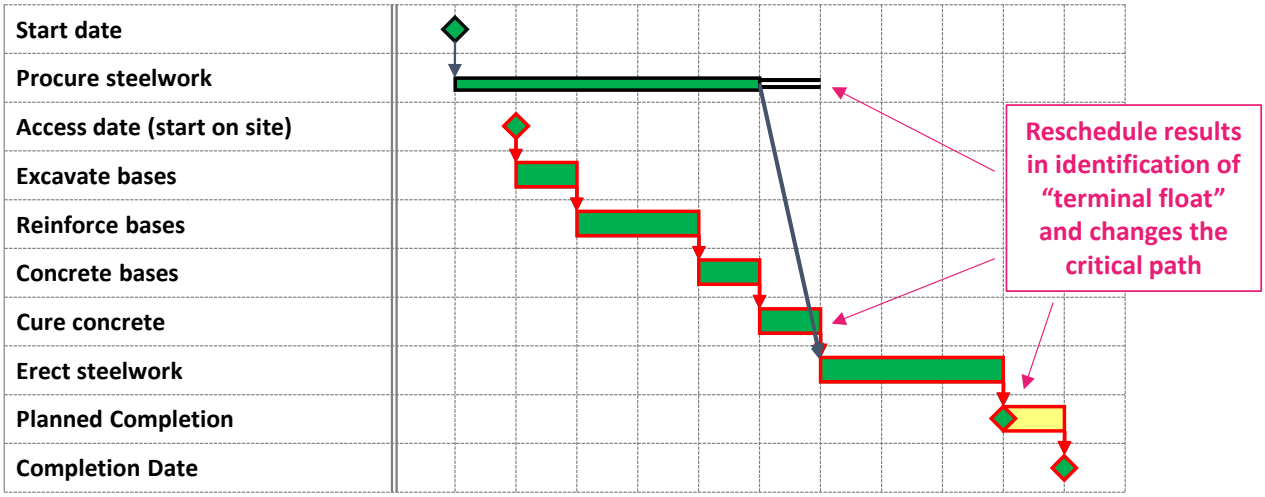
In such a scenario, it will only be after the civils works suffer more than 1 week's delay, that the delay will become "critical", and so cause a delay to "completion" (or "planned completion").

SEEKING TO MINIMISE OR ELIMINATE FLOAT

In many cases, it will often be better (more advantageous) for the Contractor to reconsider his programme, and seek to manage or eliminate the float, even before starting work. This "management" requires careful thought, as it depends on the circumstances of the programme, as well as the contract under which you are working.

For example, **under NEC**, my aim when programming this work, would be to minimise the apparent float in the programme, by planning and programming the achievement of "Planned Completion" as early as possible: That is because, in the NEC form, the Contractor is considered to "own" the "terminal float" in the programme (the period between Planned Completion and the Completion Date).

- For example, I could plan to procure the steel earlier (in a period of 5 or 6 weeks), which would mean I could adjust the programme to achieve Planned Completion earlier, and minimise the "activity float", while increasing the "terminal float", as follows:

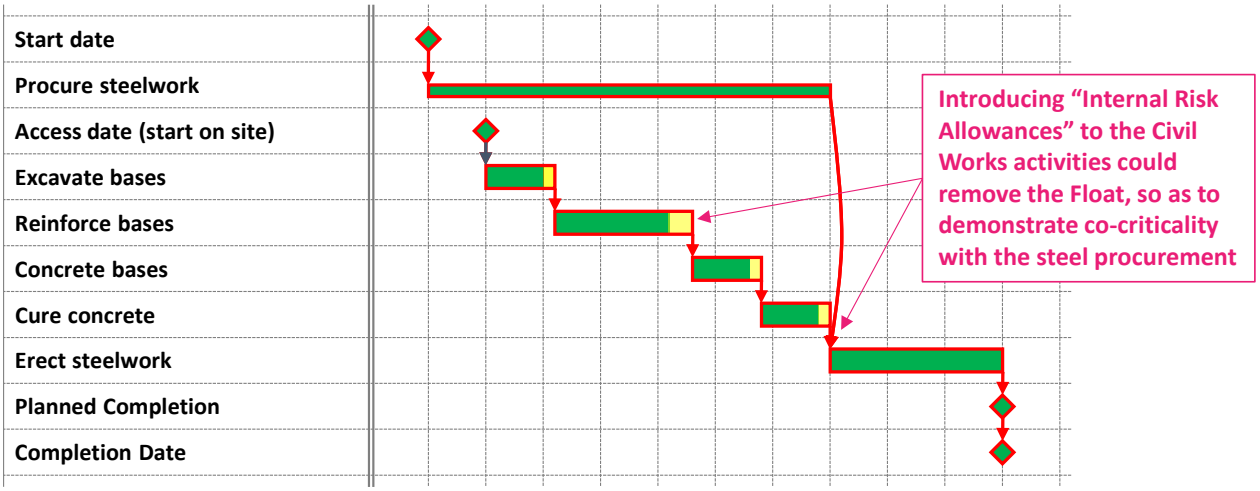


If the programme were adjusted in this way, then any delay in the progress to the physical works will demonstrate a "critical delay" to "Planned Completion" (and thus a claim for time). However, if the Contractor suffers his own delay, he still has the opportunity to "absorb it" (using the terminal float).

In contrast, under most JCT forms of contract there is no concept of "planned completion" or "terminal float" and, as such:

- It is only a "delay to the Completion Date" that falls to be considered an EOT event.
- There is minimal benefit in showing any float in the programme at all.
- As such, I might seek to adjust the "apparent float" by adjusting the durations of the

activities, increasing them to fill the apparent float period (perhaps by including "Time Risk Allowances" in the activities), as follows:



In this case, the result is that the planned programme does not show any float, and any delay (to either the steel procurement or the civils works) will potentially cause a critical delay (and thereby be a claimable matter).

Of course, there are also potential risks in removing all float from a planned programme, as the suffering of any culpable delay could result in the client identifying that (and claiming that it gives float to the other activities). My point, however, is that **thinking cautiously and sensibly about such issues in advance may reduce or remove questions about float, such that claims are easier to make (or might be made where otherwise they would not).** This is something DGA can assist with.

CAUTIONARY TALE: MANAGING FLOAT IN A CLAIM SCENARIO

The most difficult point to manage float is after a claim has started. The delay will have already occurred (in the past), and the contract and update programmes will almost certainly "exist" (be historical), so adjusting the activities and their links will be problematic. The parties are also likely to have become entrenched in their "positions".

The scope of this article does not allow me to go into any great detail about how we might assist in such situations, not least because every claim scenario has its own specific issues and complications.

However, as a cautionary tale, I consider again the "real-life example" I mentioned earlier:

- The Contract being performed was based under an NEC form.

- As the Contractor progressed the work, it identified in a Clause 32 programme update a key "Material Required By" date for some "Free-Issue Materials" by the Employer.
- The Employer provided those items over 3 months late, a clear Compensation Event ("CE").
- The Contractor considered this likely to cause a critical delay to planned completion, and showed the (very real) delay in its (subsequent) Clause 32 programme updates.
- However, the relevant Clause 32 programme (the last "Accepted Programme" before the CE occurred) did **not** contain sufficient links between the "Materials Required" date and the subsequent site activities (which were themselves not well linked to other site works).
- As a result, the "Materials Required By" date had apparent float of well over 1 year!
- The Contractor had significant difficulty properly and clearly demonstrating the "cause and effect" arising from the late provision of those materials (even though it had clearly shown the effect in later Clause 32 updates).
- The problem was compounded by the fact that the Employer did not initially accept the validity of the CE and failed to ask for formal delay quotations (at the time). As such, many months went by before a formal CE was agreed, and the parties discussed the issues.
- In the Employer's analysis, because of the lack of proper or sufficient logic linking of the Accepted Programme, when the CE was "impacted", it caused no critical delay.

This has been a tricky job to manage (which we have done with the help of the Contractor's legal advisors and their in-house team). Our work has involved:

- A full check of the Contractor's Clause 32 "Accepted Programme".
- Decisions as to the vital adjustments needed to make the "Accepted Programme" capable for demonstrating the impacts of the delay (which effectively brought the "float" calculation on the "required by" date down to just a couple of weeks).
- A detailed programme analysis to show that the 3-month delay then caused a significant (more than 10 week) delay to "Planned Completion" (in an "NEC compliant" manner).

Even with our involvement, these claims are still being considered and discussed between the parties (more than 1.5 years after the specific delay event in question) and are likely to become subject to formal Adjudication in due course.

Had the Contractor brought us in at the time of the event, we could have done many other things to assist in the management and demonstration of the delay (which may have helped to avoid some of the issues now being faced).

CONCLUSIONS – AND A KEY "TAKEAWAY" MESSAGE

While this article does no more than touch on some of the issues surrounding "float", and gives some examples and cautionary tales, I hope that it also conveys a couple of key messages:

- Proper and careful programming up front is vital.
- DGA can assist clients at all stages of its programming tasks, including:
  - Assistance / 3rd Party programme viability checks (at an early stage / at or shortly after Contract award).
  - Consideration and assistance with programme updates, particularly where issues are starting to occur, and the programme needs to be "viable" for later analysis.
  - At the point delays start to become critical, in order to identify programme issues and assist in determining the best way to demonstrate the critical delays.
- I would urge you not only to think of DGA once a delay has "landed" (when you need detailed claims / dispute management advice). Getting us involved early is likely to save money and effort in the long term (though of course we are able and willing to work with you at any point).

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Dates and times
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MORE INFORMATION

If you would like to find out more details about any of the subjects covered in this Ebriefing please contact DGA Group through the contact details below or at DGAGroup@dga-group.com

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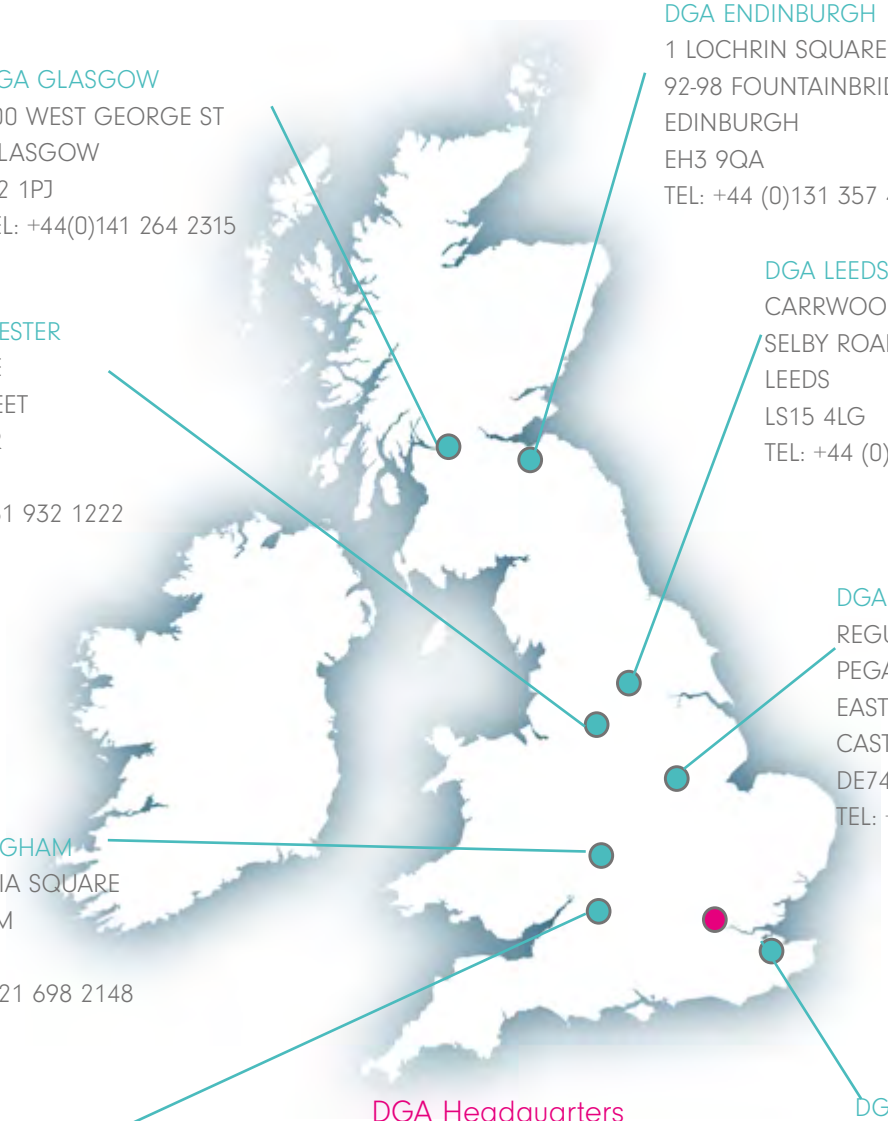

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