

Re-opener Report

MSIP – ESO Driven Works

**Project: EDF SZC Demand Connection at
Leiston Substation**

January 2023

nationalgrid

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1. Executive summary

1. This submission requests the approval by Ofgem of the need case for the additional allowances required to provide 2 x 132kV GIS Bays at Leiston 132kV Substation in Suffolk. The OMW connection is to accommodate 2 x feeder circuits for supplied to a new privately owned 132/11kV Substation (to be constructed by EDF Sizewell C [SZC]) to be called Old Abbey. National Grid are to provide the 132kV GIS bays, all other works external to the Leiston Substation would be installed by EDF SZC.
2. The preferred connection solution is to provide a 2 x GIS bay extension to existing busbars, enabling EDF SZC to install the new 132kV cables to their new Old Abbey 132kV substation. This approach minimises cost to the consumer, environmental impacts, and achieves the customer connection date.
3. Other options such as do nothing, use a DNO supply or connect to the Existing Sizewell B supplies did not meet the need or were considered too expensive as they would for example have required a 20km cable connection from the DNOs 132kV substation at Easton, compared to ~1km connection to the National Grid Substation at Leiston, which is located in close proximity to the new Sizewell C development.
4. NGET are therefore seeking funding for these works via the Medium Sized Investment Project (MSIP) reopener mechanism under the 'ESO requirements' category.
5. The proposed delivery date for the works is 27 August 2024 and all spend will be within the RIIO-T2 period.
6. The funding requested is estimated to be in the region of [REDACTED] in 18/19 price base. As outlined in communications with Ofgem dated 21 December 2023, we are expecting to tender for this project in March 2023 with the intention of having cost information back by September 2023 where we will then place orders for equipment and installation. To delay the submission until January 2024 would mean that National Grid would need to sanction the work whilst spending at risk.

2. Introduction

6. This document is the formal MSIP need case submission to Ofgem by NGET for the EDF SZC (NNB Generation Company (SZC) LTD) customer connection at Leiston during RIIO T2. This is submitted under the MSIP re-opener provided for in Special Condition 3.14 of the NGET Transmission Licence.
7. The MSIP re-opener was introduced by Ofgem to allow Transmission Owners (TO's) to apply for funding for investments under £100m not included in baseline funding. TO's MSIP submissions allow for Ofgem to carry out an assessment of the need and cost of the proposed investment.
8. This submission is made in accordance with the 'RIIO-2 Re-opener Guidance and Applications Requirements' published by Ofgem on 3 February 2022. The contents of the submission have also been informed by engagement between NGET and Ofgem with the aim of ensuring that this submission enables the Authority to make a positive timely decision on the need case.
9. The submission at this stage does not provide a cost breakdown as this is dependent on a successful tender exercise as outlined in the Procurement section of this submission.
10. The works described in this submission are required to provide a connection for a customer, EDF SZC, who are seeking 2 x 45MVA 132kV demand connection feeder circuits between Old Abbey Substation and Leiston 132kV Substation to provide construction electrical supplies for the new Sizewell C Nuclear Power Station.
11. EDF SZC have a signed connection agreement that specifies a connection date of 27 August 2024.
12. This connection was not included in NGET's RIIO-T2 baseline plan as there was insufficient certainty around the investment requirements. EDF did not commence their connection application process until 04 September 2017 and the connection agreement was not signed until 04 May 2021 following a Modification Application Process to change some of the details of the project. The certainty of the Sizewell C Nuclear Power Station has recently increased following Development Consent being granted on 20 July 2022 and Government Investment Decision announcement on 29 November 2022.
13. This connection is not deemed to be covered by either the RIIO-T2 generation or demand uncertainty mechanisms (UMs). The primary function of this customer connection is to provide additional supplies to EDF SZC for the construction of the Sizewell C Nuclear Power Station.
14. The connection will provide redundant supplies to the new customer substation which will feed 2 x 45MVA 132/11kV transformers located within the customer site. Due to the ownership boundary at the GIS / cable boxes at Leiston the associated demand transformers will not be installed by NGET, therefore has been classified as a 0MW connection under this submission.

3. Structure of the reopener submission

16. The table below signposts the structure of the document and sets out the purposes of each of the sections. This also lists the appendices. We invite Ofgem to consider the proposals set out in this submission and raise queries against anything that may require further clarification.

Chapter	Description
1. Executive Summary	A high-level summary of the submission
2. Introduction	High level overview of the project
3. Document structure	Navigation tool
4. Alignment with overall business strategy and commitments	The strategic context and overview
5. Demonstration of the needs case	Sets out the drivers for the project
6. Options analysis	Describes the range of options considered and shortlisted options
7. Preferred option and cost position	Summarises the scope of works and the planned process for provision of cost for the project post tender.
8. Project delivery and monitoring	Details the early identified key milestones of the project.
9. Price control deliverables	Obligation to deliver the works detailed
10. Overview of assurance and point of contact.	Assurance statement

Appendices	
Ref.	Title
Appendix A	Ofgem document guidance
Appendix B	Assurance statement letter

4. Alignment with overall business strategy and commitments

The strategic context

17. NGET is required by our licence to provide connections for customers. Our baseline RIIO-T2 business plan included the customer connections we had sufficient understanding of and certainty about at that time. Over the course of a price control period, it is expected that existing customers may change their plans or new customers may apply for connections that can require investment within the price control period. These changes are managed through the agreed uncertainty and reopener mechanisms.
18. The interconnections between the high voltage transmission network and the lower voltage distribution networks are provided by Super Grid Transformers (SGTs). In England and Wales, the transmission network generally consists of infrastructure operating at 275kV or 400kV. Substations that contain SGTs to provide connection to a distribution network are referred to as Grid Supply Points (GSPs). Generally, the low voltage side of the SGT will operate at 132kV, and the distribution network operator (DNO) will be the owner of the 132kV substation to which the SGT is connected.

However, some 132kV Substations such as Leiston provide connections for more than one customer. In these cases, the 132kV substation is also owned by NGET and treated as transmission infrastructure. At such sites, NGET is responsible for the infrastructure works.

5. Demonstration of the needs case

NGET Needs Case

- 19. EDF SZC conducted its own option appraisal which led to an application to NGET for a Connection to the transmission Network.
- 20. On 04 September 2017, EDF SZC submitted a Connection Application for a new supply point from Leiston 132kV Substation to a new privately owned 132/11kV substation to be located on the Sizewell C construction site. NGET is obligated by our licence to provide a connection for this customer. NGET submitted a connection date offer of 30 June 2022 to EDF SZC on 03 March 2020. The customer signed this offer on 12 May 2020 however subsequently submitted a mod-app to align with the Sizewell C programme following delays in planning consent.
- 21. NGET is obligated by our licence to provide a connection for this customer. Therefore, NGET are required to complete works at Leiston substation to ensure the connection can be made. NGET cannot provide the connection without completing these works and the subsequent formal application to connect these assets are the basis of the need case for the investment works proposed in this submission.
- 22. The primary criteria for success in this connection project is to provide the customer with a connection date that aligns with their programme to support the construction activities of the new power station.

Customer Needs Case

- 23. To facilitate construction of the new Sizewell C Nuclear Power Station, a new substation is required to provide electrical supplies for the complex of new development during the construction phase.
- 24. [REDACTED]
- 25. [REDACTED]
- 26. [REDACTED]
- 27. Consent to construct the new substation and install associated 132kV cables to provide the electrical connection to Leiston 132kV substation has been achieved following approval of the Sizewell C Development Consent Order which was granted by the Secretary of State on 20 July 2022.
- 28. Following the Government's Autumn statement, a Government Investment Decision committing £700m of investment to the Sizewell C project was announced on 29 November 2022 to support development of the nuclear project.

Section Summary – Need Case

- The need case is driven by a Connection Application from EDF SZC.
- NGET must provide a connection to the customer.
- The customer has signed a current connection agreement for connection date of 27 August 2024.
- Connection required to provide supplies for the construction of Sizewell C which has now achieved Development Consent and Government Investment.

6. Options analysis

Summary

29. To achieve the customer need, the options below consider only the works required to facilitate EDF SZC's Connection at Leiston substation.

Leiston Substation

30. [REDACTED]

31. Figure 1 shows the Leiston local transmission system schematic. Figure 2 shows an aerial view of Leiston substation and Figure 3 shows single line diagram of Leiston 132kV Substation.



Figure 1 – Location of Leiston substation on transmission network

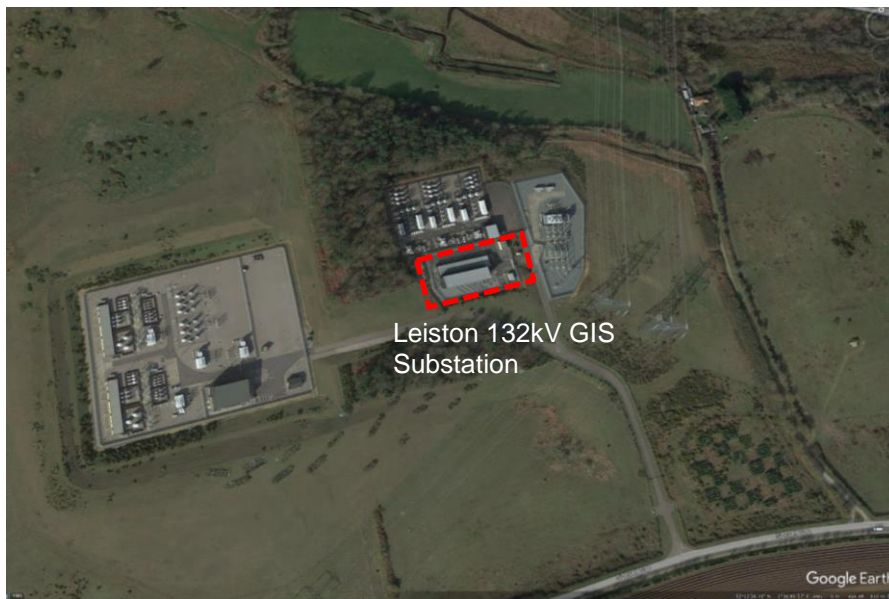


Figure 2 – Aerial view of Leiston substation



Figure 3 – Single line schematic of Leiston 132kV Substation with two new Old Abbey Circuits circled in green

Minimum Technical Requirements

32. As this is a non-embedded connection, EDF SZC's new circuits do not provide a connection for a defined volume of embedded generation, nor does it increase the group demand level applicable at the Leiston 132kV Substation.
33. To meet the requirements of a Class C supply (12-60MW demand) two connections are required, therefore two new 132kV circuits are required to be connected at Leiston 132kV substation. Two new GIS bays must therefore be provided to facilitate the connection of these circuits to the substation busbars. The new switchgear that will connect the circuits to the substation busbars (e.g., the circuit breaker and disconnector) will be Transmission Connection Assets under the responsibility of NGET due to the customer elected ownership / operation boundary as per CUSC paragraph 2.12 (f) (i).
34. NGET has studied the effect of adding the additional 132kV circuits to the Leiston site. This is undertaken to determine if the additional connection will trigger the need to upgrade any of the NGET owned assets at Leiston (or any other local NGET sites that may be affected by the new connection).
35. The studies conducted concluded that the existing assets could accommodate the new circuits without the need for upgrades to improve capacity or fault level ratings.

Long list of options

36. Generally, NGET will assess the following categories of options when assessing how to facilitate new connections:
 - Do nothing
 - Whole system / market-based solution
 - Use / enhancement of existing assets
 - Construction of new assets

Do nothing

37. This option is not a viable option to this need case as NGET is obligated under licence to provide a connection for this customer. There is no way to facilitate the customer's application without providing some form of direct access to the transmission system.

Whole system / market-based solution

38. The requested connection from EDF SZC requires a connection to the transmission network. Therefore, as a connection to the transmission network must be provided for this customer there is no whole system or market-based alternative to providing a physical connection to the transmission network. The connection does not trigger any other works in the local transmission network (e.g., replacement of circuit breakers due to increased fault levels or increased circuit ratings to manage higher loadings). Therefore, no whole system or market-based solutions need to be investigated as alternative to any infrastructure works required beyond the customer connection point.

Use / enhancement of existing assets

39. NGET has investigated options to utilise existing infrastructure at the Leiston substation to reduce the cost and timescales for two new 132kV circuit connections. As the existing GIS building includes provision and space for future bays, NGET can extend the GIS substation to populate this area with new GIS equipment so that EDF SZC can connect. With this approach the construction of a site or building extension, or construction of substantial new assets such as additional SGT's connected to the 400kV OHLs to provide the connection is not required.

40. The option of using the existing future bay provision enables the re-use of existing infrastructure and hence reduces the scope of works that must be carried out. This results in lower costs for both NGET and EDF SZC and is therefore the most cost-effective option for the end consumer.

Construction of new assets

41. NGET considers the use of the existing assets as the most cost-effective solution to the Connection request.

Selection of the preferred option

42. We initially identified a range of options that could potentially fulfil the needs of EDF and provide a connection in the timescales required.

No.	Option	Cost (£m)	Timescale	Selected (Y/N)
1	Do Nothing	£0	N/A	N
2	Whole System / Market-Based	N/A	N/A	N
3	Existing Assets – Busbar extension and new bays within existing building and protection equipment	XXXXXXXXXXXX XXXXXXX	August 2024	Y
4	New Assets / Extension – e.g., new SGT connection from 400kV OHL	N/A	N/A	N

Table 1 – Option summary

43. Investigation of the options identified that whole system and market-based options were not applicable in this case due to the need for the customer to have direct access to the transmission system.

44. To provide the connection, NGET will provide busbar extension and two new GIS bays and associated light current equipment (e.g., busbar protection, SCS) such that EDF SZC can connect to the newly constructed feeder bays. The site has sufficient room for new bays to be constructed

for the connection. The most cost-effective and efficient way to construct a new bay is to utilise existing space on the west side of the GIS hall.

Section Summary

- **Do Nothing, Market, and Whole System solutions were considered and ruled out as they can't meet the need case.**
- **The option to provide the customer a connection via existing assets / infrastructure was chosen as there is provision for future bays available.**
- **As there is spare bay provision available there was no need to extend the site or build a new site.**
- **The chosen connection option satisfies the technical requirements of the customer in providing 2 new 132kV circuits to supply their new 132/11kV substation.**

7. Preferred option and cost position

Population of the Spare bays – Leiston 132kV Substation

45. The preferred option is for NGET to populate the future bays within the existing GIS hall at Leiston 132kV substation. This reduces the requirement for substantial civil works to be completed by NGET, providing efficiency and cost savings for the consumer. The available area within the existing building is shown in Figure 4.

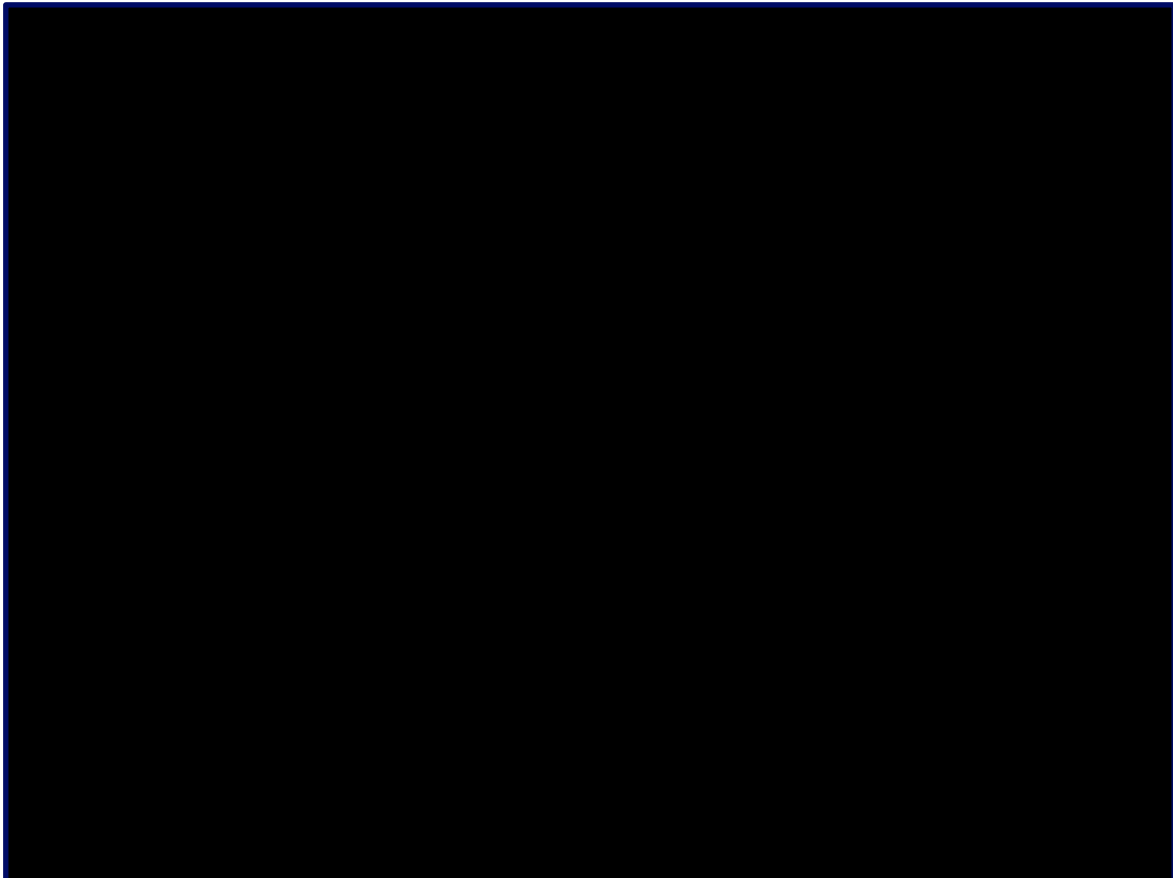


Figure 4 – Leiston 132kV GIS Hall Spare Bays

46. NGET will carry out extension of the substation busbars (double bus) for the new GIS bays and construct the 2 new feeder bays up to the cable sealing ends as Transmission Connection Assets. EDF SZC's contractors will install new 132kV cable and terminate this into the cable sealing ends provided by NGET. Associated ancillary and common / bay-level protection works within the NGET Leiston 132kV site will be carried out by NGET's Contractors with the feeder protection provided by the customer, as they will own / operate the new feeder circuits.
47. EDF SZC will construct the new 132/11kV substation and install the 132kV cables to Leiston. EDF SZC have chosen to carry out this work given the extent of development works they will be undertaking within the new Sizewell C complex and EDF own the land that the cables will be located on.
48. NGET will install and commission new protection and control related works, in addition to necessary interface with the existing 132kV GIS Equipment. Due to the obsolescence of the existing switchgear variant installed at Leiston (F35-2) and intent to procure non-SF6 switchgear for the new extension to support SF6 inventory reduction, a transition interface joint will be required to connect between the new and existing GIS equipment. We are currently updating our SF6 policy, working with the OEM supply base to get the most accurate information about SF6-free asset availability, and we will continue to incorporate this latest information into our schemes as this becomes available.

Work Summary

49. The works by NGET to facilitate the connection includes:

- NGET Transmission Connection Asset Works

- [Redacted]

- [Redacted]

- NGET Infrastructure Asset Works

- [Redacted]

- [Redacted]

- User Works (undertaken by others)

- [Redacted]

- [Redacted]

- [Redacted]

- [Redacted]

Cost Position

50. At the point of submission of this MSIP paper, relevant cost information is not available for inclusion due to the projects intended tender process timeline of going out to market March 2023, with the aim of having cost information from our supply chain by the end of September 2023. Depending on the results of the tender process, we will then place orders for equipment and installation. To delay this submission until the January 2024 MSIP Price Control Period would impact our licence and contractual responsibilities to achieve the customer connection agreed date and result in uncertainty of funding for National Grid.

51. In recognition that during December 2022 there have been discussions between Ofgem and TO's about adding an additional MSIP Price Control Period into license as part of the ASTI discussions and discussions regarding resource implications within Ofgem over the current winter period. Whilst we welcome the possibility of increasing the volume of Price Control Period's within the license for MSIP submissions, these discussions are currently in their infancy and carry a level of uncertainty with regards to the development of this proposition and timeliness. NGET therefore requests that detailed costs are provided post our tender process in conjunction with ongoing engagement with Ofgem to provide updates where applicable. We believe that this request will also support Ofgem with regards to the current winter resource implications as well as assist NGET with regards to the timings of our tender process for this project.

Risk & Contingency

52. The key programme and project risks are still in development and will be finalised as part of the tender process once NGET have identified the successful delivery partner.

Procurement Strategy

53. This project will be procured through National Grids Primary Equipment Framework and installed by one of National Grids M & E Framework Contracts. The Tender for this work will be Launched in Q1 2023 and we anticipate the tender process to be completed by the end of Q3 to enable us to then place orders for equipment and installation.

Cost benefit analysis

54. Our assessment of options using estimated costs has shown that the preferred option offers the lowest cost option for consumers as additional costs would be incurred to connect to the DNO, the earliest connection date for the customer, and the lowest level of technical and project risk.

55. As such, in line with Ofgem's guidance to develop MSIP submissions that are proportional to scale and cost of the investments proposed, it is not considered necessary or efficient to undertake a CBA process as part of this submission as the reasoning behind the selection of the preferred option are clear based on the information presented in this submission.

Section Summary – Preferred Options and Detailed Costs

- The preferred option requires NGET to install 2 new GIS feeder bays within the available space in the existing Leiston 132kV GIS building, including the necessary new light current equipment associated with extending the existing substation by 2 bays.
- The total cost of the connection is to be determined post tender exercise September 2023.
- Detailed cost information is to be provided post tender exercise September 2023.
- On-going engagement between Ofgem and NGET to continue post submission to develop understanding of project costs.

8. Project delivery and monitoring

64. A detailed project delivery plan will be prepared by the NGET scheme team post completion of the tender exercise. This plan will facilitate the customer's contracted connection date of 27 August 2024.

65. The key project milestones are summarised below: -

MILESTONE	DATE
Tender Launch	
Tender Returns	
Tender Review	
Sanction	
Contract Signed	
Contract Awarded	
Order Hardware	
Secondary Design Complete	
Primary Design Complete	
First Site Access	
Installation works Complete	
Available for Commercial Load	

Programme Coordination

66. The key stakeholders identified by NGET in this project are: EDF SZC (the customer) and the ESO.

67. NGET will work closely with EDF to develop the project and agree a programme that meets their needs to achieve the desired connection date. To ensure our investment is efficient, we will closely track the progress of the customer in developing their aspects of the connection to ensure that NGET does not invest ahead of need.

68. The latest status of the customer project is summarised below: -

MILESTONE	Status	Date
Accept NG Offer	Complete	
Final Electrical Design	Planned / On Target	
Pre-Outage Electrical Plant Installation	Planned / On Target	
Outages for Connection of New Equipment	Planned / On Target	
Demobilisation	Planned / On Target	

The progress of the customer following consent awarded and Government Investment indicates that they will be ready to connect by the contracted date and hence our investment should continue as planned to meet this agreed date.

9. Price Control deliverables

69. As there is no measurable output in terms of contracted TEC or transformers to be delivered by NGET for this project, it is proposed that an evaluative Price Control Deliverable is defined.
70. Provide a connection to EDF SZC for two new 132kV feeder circuit from Leiston 132kV Substation for 27 August 2024.

10. Overview of assurance and point of contact

71. Appendix A, the assurance statement letter, is the written confirmation in line with the assurance requirements set out in Ofgem's Re-opener Guidance, dated 03 February 2022¹.

72. This confirmation is provided by the New Infrastructure Regulation Manager, Electricity Transmission where they are accountable for re-opener submissions for National Grid Electricity Transmission (NGET) including any changes to these allowances. They provide the following statements below regarding how this MSIP application has been prepared and submitted in relation to each of the three assurance points requested by Ofgem:

- It is accurate and robust, and the proposed outcomes of the MSIP submission are financeable and represent best value for consumers.
- There are quality assurance processes in place to ensure the licensee has provided high-quality information to enable Ofgem to make decisions which are in the interests of consumers.
- The application has been subject to internal governance arrangements and received sign off at an appropriate level within the licensee.

73. NGET's designated point of contact for this MSIP application is [REDACTED], Regulatory Development Manager, email [REDACTED], telephone [REDACTED]

¹ [Re-opener Guidance and Application Requirements Document \(ofgem.gov.uk\)](https://www.ofgem.gov.uk/re-opener-guidance-and-application-requirements-document)
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11. Appendices

Appendix A – Assurance Letter Statements



APPENDIX A -
Assurance Statement

Appendix B – Ofgem document guidance



APPENDIX B - Ofgem
Document Guidance -

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