Report on actuarial valuation as at 31 December 2020

National Union of Rail, Maritime & Transport Workers Orphan Fund

15 December 2021

As instructed, we have carried out an actuarial valuation of the Orphan Fund ("the Fund") as at 31 December 2020, in accordance with the requirements of the Trade Union and Labour Relations (Consolidation) Act 1992, and I now present my report, which is addressed to the Council of Executives of the National Union of Rail, Maritime & Transport Workers.

The report on the previous valuation of the Fund as at 31 December 2015 was dated 16 December 2016.

The main purpose of the valuation is:

- to compare the value of the liabilities of the Fund in respect of the benefits payable to orphans with the value of the assets attributed to the Fund; and

- in the light of the results of those calculations, to assess what changes, if any, might be made to benefit or contribution rates.

In addition, under regulation 40(4) of the above-mentioned Act, I must state in this report whether in my opinion:

- contribution rates are adequate;

- the accounting or funding arrangements are suitable; and

- the fund for the payment of benefits is adequate.

A copy of this report should be sent to the Certification Officer within a year of the valuation date ie by 31 December 2021.

On request, a copy of this report must be supplied to any of the Union's members free of charge.

An executive summary of this report is provided in the next section and further details of my valuation of the liabilities and assets of the Fund are set out in the remainder of the report.

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Appendices

1. Executive Summary

1.1. We were supplied with details of 289 children (2015: 306) from 193 families as at the valuation date receiving benefits totalling £3,579 per week (2015: £3,804). Of these, 148 (2015: 176) were in receipt of the higher benefit payable to children over 16 years of age.

1.2. We understand from Laura Rolles, that of the 289 children, some children had their benefits paused (until they return to full-time education or provide the required evidence). We have assumed that these children immediately receive benefits again in our valuation.

1.3. The value of the Fund's notional assets stood at £3,029,000 at 31 December 2020 (2015: £1,902,000). There are no assets specifically allocated to the Fund. Investment income is transferred to the Fund as a direct percentage of the size of the Fund to the Union's total funds. Over the period since the previous valuation, the average rate of return credited to the Fund was approximately 1.1% pa.

1.4. There is a commitment in the accounts for transfers from the Union's General Fund as necessary to ensure that the Orphan Fund does not suffer a deficit in future years.

1.5. The funding objective that has been adopted for the Fund is to hold sufficient assets to cover the Fund's liabilities for the benefits payable to current orphans. This objective is similar to that adopted at the previous valuation.

1.6. In order to meet this objective, I have carried out this valuation using the actuarial method known as the "Projected Unit" method.

1.7. The key differences in the actuarial assumptions compared with the previous valuation are as follows:

- The interest rate has been changed from 1.5% pa to 1.1% pa to reflect experience over the inter-valuation period.

- The mortality table for Union members and their spouses has been updated to reflect the most recently published tables and projections, as well as recent experience.

1.8. The funding position at 31 December 2020 is summarised in table 1.

Table 1: Funding position

Value of:	£'000
Funding target	900
Assets	3,029
Surplus / (deficit)	**2,129**

1.9. The equivalent result at the previous valuation was a surplus of £1,007,000.

1.10. The significant increase in surplus over the period was predominantly due to fewer than expected member deaths (and hence fewer new orphans) and fewer members leaving orphans. This was partially offset by benefits being paid for longer than assumed.

1.11. The calculated contribution rate for Union members at the valuation date (before adjustment for any surplus or deficit) is 7.3p per week. This is lower than the rate currently paid by Union members of 8.0p per week.

1.12. The calculated contribution rate has decreased slightly from 8.0p per week at the previous valuation to 7.3p per week at this valuation, principally due to changes in the assumptions about Union member mortality.

1.13. The results are sensitive to the assumptions chosen and in section 9 there is analysis of the effects of changes to some of the key assumptions.

1.14. With reference to regulation 40(4) of the Trade Union and Labour Relations (Consolidation) Act 1992, I have confirmed in my report that, in my opinion, the valuation shows that contribution rates are adequate, the accounting and funding arrangements are suitable, and the fund for the payment of benefits is adequate.

1.15. If contributions continue to be paid at current rates, and future experience is in line with the valuation assumptions, the Fund is projected to continue to have a surplus which will increase further with investment returns.

1.16. If accumulating surplus within the Fund is considered inappropriate, this may be addressed by either reducing the contributions paid by Union members or by increasing the level of benefits paid to orphans or by meeting expenses of the Fund. Examples are provided in section 10, but alternatives are possible. Please let me know if you would like me to calculate the impact of alternatives.

1.17. The next valuation is due no later than 31 December 2025.

2. Constitution of the Fund

2.1. The Fund is formally governed by the Rules of the National Union of Rail, Maritime & Transport Workers.

2.2. The main details of the Fund are set out in Rule 21 of the RMT Rule Book. We were previously provided with a copy of this rule by Vicky Thompson in her email dated 23 August 2016 and we understand that there have been no changes to this rule since the previous valuation.

2.3. The Fund is controlled and administered by the Union's Council of Executives and must be used exclusively for the benefit of the children of members.

2.4. At our meeting on 9 August 2016, Vicky Thompson and Laura Rolles gave us full details and understanding of the constitution and benefits of the Fund. We understand that these remain unchanged since the previous valuation.

3. Benefits and contributions

3.1. Upon the death of any member of the Union, or, since September 2006, the member's spouse, before the member has qualified to receive the Union Retirement Benefit (or who has already qualified to receive Retirement Benefit and has not been subsequently employed prior to death), an orphan's benefit is payable to each of his or her qualifying children.

3.2. To qualify for benefit, a child needs to be under 16 at the date of the parent's death or under 22 and still in full-time education. The benefit is payable until the child reaches age 16, and then continues while the child remains in full-time education, up to a maximum age of 22. The benefit may cease earlier if the circumstances of the surviving parent change – principally if he or she remarries.

3.3. At the valuation date, the scale benefits provided by the Orphan Fund were £12.00 per week to each child up to age 16 and £12.75 per week to each child over age 16. These rates have applied since September 2006.

3.4. If a child leaves full-time education between 16 and 22, the benefit will be paused and then restarted if they return to full-time education. Payment may be delayed, and then back-payments made if the correct proof of the child being in full-time education is not received at the time the benefit is due.

3.5. A rate of 8p per member per week is apportioned to support the Orphan Fund from the larger regular contribution paid to the Union by each of its members. This rate was introduced with effect from January 2010. Over the years, the Fund has also benefited from donations from a variety of sources, but no credit has been taken in the valuation for any such donations that may be received in future.

3.6. In recent years, the whole of the expenses associated with the administration of the Orphan Fund have been borne by the Union from resources outside the Fund. The rules of the Union provide for such further support for the Fund as may be necessary from the general assets of the Union and accordingly we have not included an allowance in the valuation for the cost of future expenses.

4. Membership

4.1. The membership data used for the valuation was extracted from the data provided by Laura Rolles in her emails dated 1, 10 and 17 February 2021. We have relied on this data and have no reason to doubt the overall accuracy of the data provided for the purposes of the valuation.

4.2. At the valuation date, the Union had 82,204 members, of whom 79,099 were aged under 65. When we last valued the Fund there were 80,015 members, so the membership has increased during the past five years. 83% of the Union members were male.

4.3. We were supplied with details of 289 children (2015: 306) from 193 families as at the valuation date receiving benefits totalling £3,579 per week (2015: £3,804). Of these, 148 (2015: 176) were over 16 years of age.

4.4. We understand from Laura Rolles that of the 289 children, some children had their benefits paused (until they return to full-time education or provide the required evidence). We have assumed that these children immediately receive benefits again in our valuation.

4.5. There were no children for whom benefit was being accumulated as at the valuation date.

4.6. The Union's accounts for the year ended 31 December 2020 reported a total of 275 children. Laura Rolles confirmed that the difference in figures was due to some late notifications after the accounts had been audited.
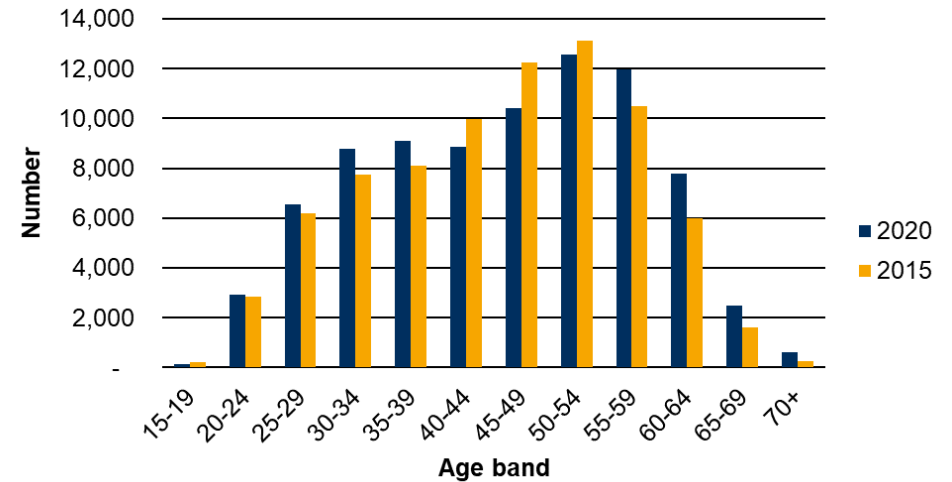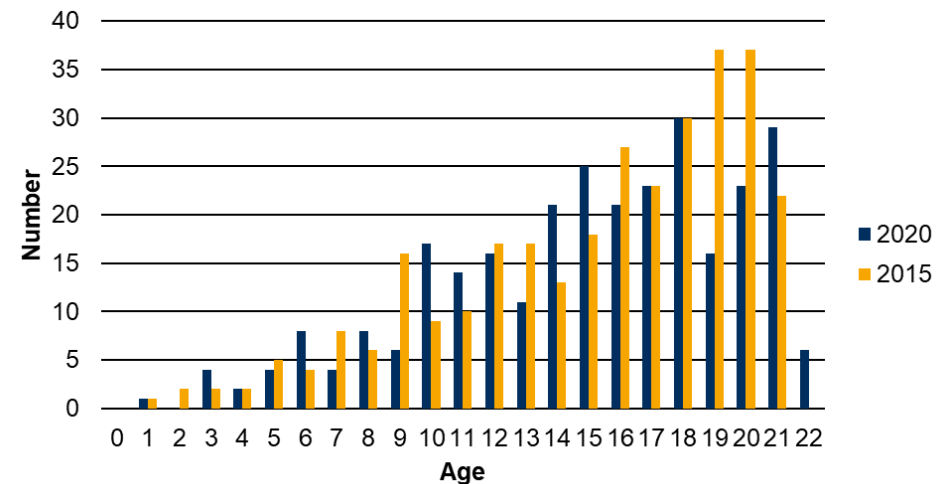
Chart 1: Age distribution of Union membership

Chart 2: Age distribution of children

5. Assets

5.1. Sailesh Mehta of HW Fisher and Laura Rolles have supplied us with copies of the audited accounts for the five years to 31 December 2020 in their emails dated 12 March, 6 May and 8 November 2021 and we have relied upon these. A consolidated revenue account for the inter-valuation period is set out in table 2 to the right.

5.2. The value of the Fund's assets stood at £3,029,000 at 31 December 2020.

5.3. There are no assets specifically allocated to the Fund, although a notional figure is recorded. Investment income is notionally transferred to the Fund as a direct percentage of the size of the Fund to the Union's total funds. The value of the Fund's assets is therefore a notional amount held within the Union's total funds.

5.4. Over the period since the previous valuation, the average rate of return credited to the Fund was approximately 1.1% pa. We show in section 7 the impact of this return compared to the assumption made at the previous valuation.

5.5. There is a commitment in the accounts for transfers from the Union's General Fund as necessary to ensure that the Orphan Fund does not suffer a deficit in future years.

Table 2: Consolidated revenue account

	£'000	£'000
Opening fund as 1 January 2016		**1,902**
Income		
Contributions	1,702	
Donations	-	
Other income	10	
Total income		1,712
Expenditure		
Benefits	714	
Other expenses	-	
Total expenditure		(714)
Investment income		129
Closing fund at 31 December 2020		**3,029**

6. Funding objectives, method and assumptions

6.1. The funding objective that has been adopted for the Fund is to hold sufficient assets to cover the Fund's liabilities for the benefits payable to current orphans. This objective is similar to that adopted at the previous valuation.

6.2. In order to meet this objective, I have carried out this valuation using the actuarial method known as the "Projected Unit" method. Under this method:

- The funding target is calculated as the amount of assets required as at the valuation date to meet the projected benefit cashflows from the Fund based on the current population of orphans eligible to receive benefits as at that date.
- The required contribution rate is calculated to be sufficient to meet the cost of new orphan benefits arising from the death of Union members or their spouse over the year following the valuation date. The rate determined is sensitive to changes in the age profile of the Union membership.

6.3. This method is the same as that adopted at the previous valuation.

6.4. To calculate the funding target and to calculate the contributions to be paid, we need to make a number of assumptions. The main assumptions I have adopted for the 2020 valuation are summarised in table 3. The assumptions adopted for the 2015 valuation are also shown for comparison.

Table 3: Main assumptions

Assumption	2015	2020
Financial		
Interest rate	1.5% pa	1.1% pa
Demographic		
Termination of orphan benefit	Decrement rates varying by age – see Appendix 2	Decrement rates varying by age – see Appendix 2
Average age of termination	18.9	18.9
Mortality of Union members and their spouses	S2NA light table for males and 80% of the S2NA table for females with CMI 2015 core projections and a long-term rate of improvement of 1.5% pa	S3NA light table for males and 80% of the S3NA table for females with CMI 2020 core projections and a long-term rate of improvement of 1.5% pa
Age of spouse	Wives 3 years younger than husbands	Wives 3 years younger than husbands
% married	100%	100%
% of deceased members (or their spouses) leaving orphans *(sample %'s at different member ages)*	**Age** **%** 20 8.2 30 33.9 40 45.3 50 23.8 60 2.1	**Age** **%** 20 7.2 30 32.5 40 45.0 50 25.3 60 6.1
Average number of orphans left by deceased parents *(sample numbers at different parent ages)*	**Age** **No.** 20 1.00 30 1.89 40 2.06 50 1.69 60 1.48	**Age** **No.** 20 1.00 30 1.79 40 1.92 50 1.60 60 1.42

Assumption	2015		2020	
Average age of orphans when parent dies *(sample orphan ages at different parent ages)*	**P. age**	**O. age**	**P. age**	**O. age**
	20	1.00	20	1.00
	30	4.72	30	4.91
	40	9.33	40	9.22
	50	12.26	50	12.21
	60	11.60	60	12.67
Retirement age	65		65	
New entrants and withdrawals	No explicit allowance		No explicit allowance	
% of members contributing	100%		100%	
Expenses	Nil		Nil	

6.5.   A projection of the Fund's future undiscounted benefit cashflows, based on the orphans at the valuation date and the assumed decrement rates for the termination of the orphan benefit, is shown in chart 3. This does not allow for benefits in respect of new orphans.

Chart 3: Projected undiscounted benefit cashflows
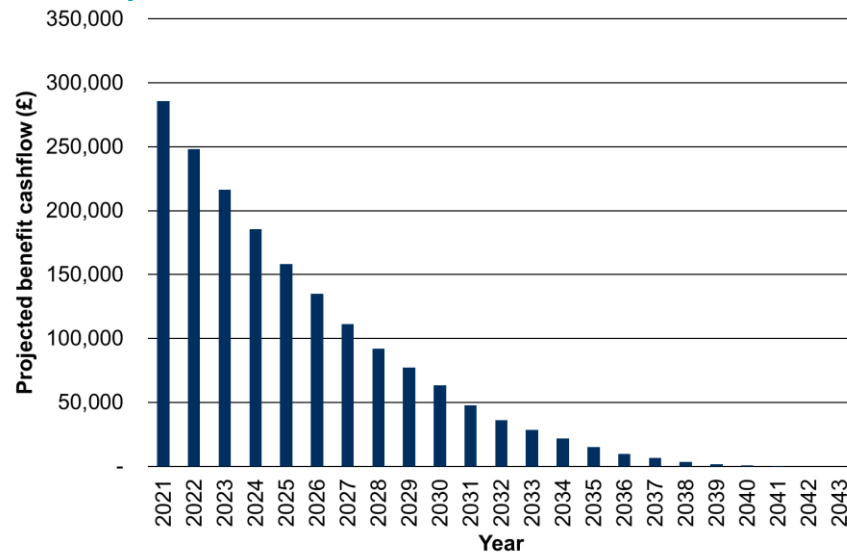
6.6.   The total projected undiscounted benefit cashflows amount to £945,000. The benefits provided by the Fund and hence the projected cashflows are not inflation linked and thus are fixed in nature.

6.7.   In order to determine the assumptions to use for this valuation, we analysed the historical experience of the Fund as regards interest, orphan decrement rates, mortality, the percentage of deceased members leaving orphans, and the average number and age of orphans left by deceased parents.

6.8.   Details of our experience analysis are provided in Appendix 1 and further details of the assumptions are provided in Appendix 2.

6.9.   The key differences in the assumptions compared with the previous valuation are as follows:

- The interest rate has been changed from 1.5% pa to 1.1% pa. This change produces a higher funding target and higher required contributions.
- The mortality tables for Union members and their spouses have been updated as per the table above reflecting latest published tables.
- The other assumption changes only had a minor impact on the funding target and required contributions.

6.10.   The sensitivity of the funding requirement and required future contribution rate to interest and mortality is set out in section 9.

6.11.   The Fund faces a number of investment-related and other risks. Appendix 3 provides a summary of some of the significant risks faced by the Fund.

7. Funding target

7.1. Based on the method and assumptions described in section 6, the funding target and net funding position at 31 December 2020 are shown in table 4.

Table 4: Funding position

Value of (£'000):	2015	2020
Funding target in respect of		
Orphans under age 16	671	717
Orphans aged 16 or more	224	183
Unpaid accrued orphan benefits	-	-
Total	895	900
Assets	1,902	3,029
Surplus / (deficit)	1,007	2,129

7.2. The position has therefore improved by £1,122,000 and the main reasons for this are shown in chart 4.

7.3. The significant increase in surplus over the period was predominantly due to membership experience partially offset by lower than expected returns on assets.

Chart 4: Tracing experience over five years to 31 December 2020
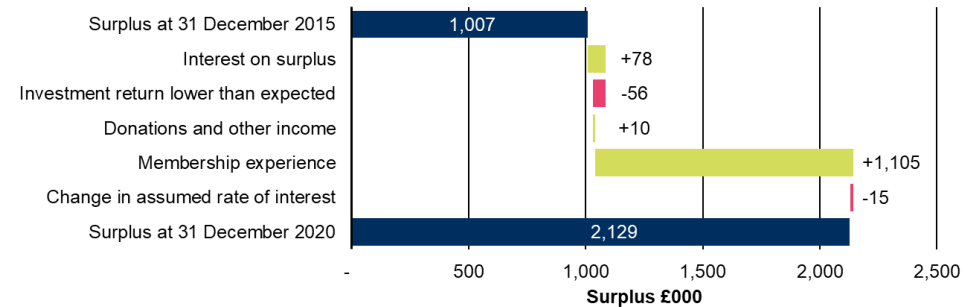
7.4. Membership experience represents the actual experience being different to what was previously assumed. It is primarily due to fewer than expected Union member deaths (and hence fewer new orphans). The actual number of deaths was around 73% of the expected number under the mortality table used for the previous valuation, leading to a much lower advent of orphan benefits than had been expected.

7.5. Membership experience is also due to fewer members and spouses leaving orphans upon their deaths than expected and then each death on average leaving a lower number of orphans than expected and slightly older orphans than expected (leading overall to lower benefits paid than assumed).

7.6. This was offset by orphans continuing to receive benefits for longer than expected, which we anticipate is due to more orphans remaining in full time education than historically. If this trend continues over the next five years, we may look to revise this assumption at the next valuation.

8. Contribution rate

8.1. Based on the method and assumptions described in section 6, the calculated required future contribution rate for Union members at the valuation date (before adjustment for any surplus or deficit) is broadly 7.3p per member per week (which is lower than the current contribution rate to the Fund of 8.0p per member per week).

8.2. The expected value of benefits accruing over the next year and the value of the current contribution rate is shown in table 5.

Table 5: Contributions for future membership per year

Value of (£'000):	2015	2020
Benefits	323	308
Contribution of 8p per week	322	337

8.3. The equivalent calculated contribution rate at the previous valuation was around 8.0p per week. The decrease is predominantly due to the change in the mortality assumption (fewer Union members and their spouses assumed to die in the future with children under the relevant ages and hence fewer new orphan benefits will come into payment), combined with the change in the age distribution of the Union membership (more under 40 and over 55, with fewer 45 to 55 year olds who are most likely to have children). This is partially offset by a decrease to the assumed rate of interest used to discount projected benefit payments from the Fund.

9. Sensitivity to assumptions

9.1. The results are sensitive to the assumptions chosen and in this section we look at the effects of changes to some of the key assumptions.

9.2. The results are sensitive to the assumed rate of return on investments. By way of illustration, the effect of a change of 1% pa in the interest rate, and of making no allowance for interest is as shown in table 6.

Table 6: Sensitivity to assumed interest rate

	% pa	Surplus £'000	Future contribution rate p per week
Actual rate used	1.1	2,129	7.3
Higher rate	2.1	2,166	6.9
Lower rate	0.1	2,088	7.7
No allowance for interest	0.0	2,084	7.8

9.3. The results are also sensitive to the assumed benefit termination age. The current assumption as shown in Section 6 of this report results in an average termination age of 18.9 years old. If we were to update this assumption and increase the assumed average termination age to 20 years old the results would be as shown below:

Table 8: Sensitivity to average termination age

	Surplus £'000	Future contribution rate p per week
Current assumption – 18.9 years old	2,129	7.3
Sensitivity – 20 years old	2,068	7.8

9.4. The calculated future contribution rate is particularly sensitive to the mortality assumption. To the extent that the mortality assumption underestimates the number of deaths, the calculated contribution rate will be too low, all other things being equal, and vice versa. The effect on the future contribution rate of varying the mortality assumption would be as shown in table 7.

Table 7: Sensitivity to mortality assumption

	Mortality Table	Future contribution rate p per week
Actual assumption	S3NA light table for males and 80% of the S3NA table for females with CMI 2020 core projections and a long-term rate of improvement of 1.5% pa	7.3
Assumption at previous valuation	S2NA light table for males and 80% of the S2NA table for females with CMI 2015 core projections and a long-term rate of improvement of 1.5% pa	7.9

9.5. It is worth noting that the Fund has a substantial surplus now, so would be able to absorb substantial adverse experience before a deficit arose.

10. Contribution and benefit policy

10.1. If contributions continue to be paid at current rates, and future experience is in line with the assumptions set out in section 6, the Fund is projected to continue to build up surplus, and to have a surplus of around £2,400,000 at the date of the next valuation, 31 December 2025.

10.2. However, actual experience is unlikely to be in line with the assumptions made in calculating the funding target and determining contribution requirements. Therefore, the surplus might build up faster or slower than projected.

10.3. In line with Sailesh Mehta's letter of 24 November 2021 we have considered a few possible actions which would address the surplus in the Fund. These actions are explained in the points below.

- One suggestion would be to make a one-off payment to all orphans of £600 each. The total payment would have been equal to £173,400 based on the number of orphans as at 31 December 2020, using the data Laura Rolles provided for the purposes of the valuation, and would have reduced the surplus by that amount.

- Benefits could be increased. Benefits were last increased in 2006, when the benefit for children aged under 16 was increased from £10 per week to £12 per week. For example, if from 1 January 2023 the benefit for under 16s was increased to £20 per week, and the benefit for over 16s was increased to £25 per week, the current surplus would be reduced to £1,608,000 and the calculated contribution rate would be increased to 12.1p per week. Assuming the current contribution rate of 8p per week continued to be paid, the surplus would be projected to fall gradually to around £678,000 at the next valuation. Note that it may be difficult to reduce benefits in the future and so you may like to increase benefits by a smaller amount initially and then re-visit this decision once the outcome of the next valuation is known.

- Contributions to the Orphan Fund could be reduced or a "contribution holiday" taken. For example, if contributions were temporarily reduced to 2p per member per week from 1 January 2023, the surplus would be projected to fall gradually to around £1,638,000 at the next valuation.

- Future contributions to the Orphan Fund could instead be paid into an escrow, such that no further surplus builds up within the Orphan Fund. We would like to understand further how this would work in practice. In particular, you should seek legal advice on the interaction of an escrow with the Orphan Fund to see if this is possible. If you would like to proceed, LCP has a Streamlined Escrow service that may be of interest to you. This is a cost-effective, time-efficient way to set up an escrow and uses a pre-negotiated agreement between BNY Mellon, acting as escrow agent, and the other parties to the escrow. Further details can be found here. Please let us know if you would like to discuss this any further.

10.4. Alternative changes to those illustrated would be possible. Please let me know if you would like me to calculate the impact of alternatives.

10.5. Finally, a word of caution. Even though the assets are calculated to be sufficient to cover the funding target at the valuation date and the surplus is projected to increase, it is nonetheless possible that a deficit might still arise in future as the funding methodology incorporates material investment and demographic risk, as described in the sections above and in Appendix 3.

11. Conclusion

11.1. With reference to regulation 40(4) of the Trade Union and Labour Relations (Consolidation) Act 1992, I confirm that, in my opinion, the valuation shows that contribution rates are adequate, the accounting and funding arrangements are suitable, and the fund for the payment of benefits is adequate.

11.2. As explained in section 10, if contributions continue to be paid at current rates, and future experience is in line with the assumptions set out in section 6, the Fund is projected to continue to build up more of a surplus.

11.3. If accumulating surplus within the Fund is considered inappropriate, this may be addressed by either reducing contributions or increasing benefits. Examples are provided in section 10, but other alternatives are possible. We would be happy to work with the Union over the coming months to consider appropriate options. Any changes in benefits would then be allowed for in future valuations.

11.4. The next valuation is due no later than 31 December 2025.

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Professional standards

Our work in preparing this document complies with Technical Actuarial Standard 100: Principles for Technical Actuarial Work.

The use of our work

This work has been produced by Lane Clark & Peacock LLP under the terms of our written agreement with the Council of Executives of the National Union of Rail, Maritime & Transport Workers ("Our Client").

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Appendix 1 – Experience
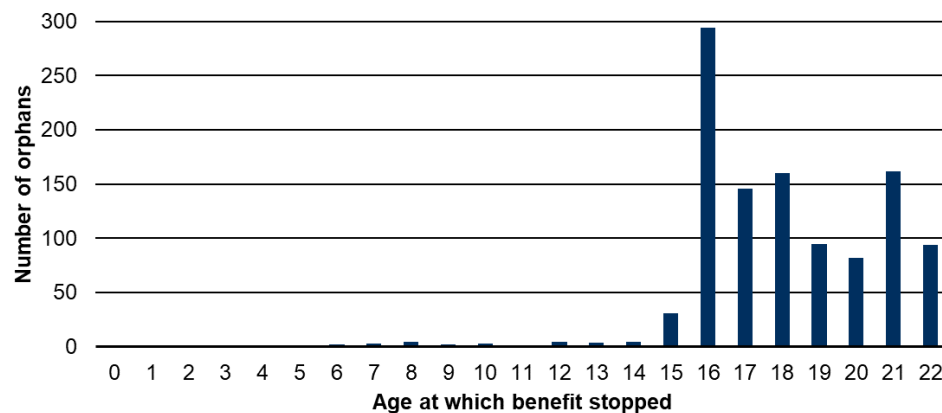
1. Benefit termination age

The age at which an orphan's benefit will cease is dependent mainly on the time spent after 16 in full-time education, but also on orphans' mortality, spouses' remarriage rates and other causes of cessation.

From 29 June 1992, the benefit payment period was extended to age 22 for those children who remained in full-time education. Previously the maximum age was 18. We have therefore confined our investigation to benefit terminations on or after 29 April 1992 to see whether the average age at termination has changed from the average age of 18.9 assumed at the previous valuation.

From the orphans data provided, we identified 1,096 children whose benefits terminated on or after 29 June 1992. The distribution of age at termination that we identified is shown in chart 5.
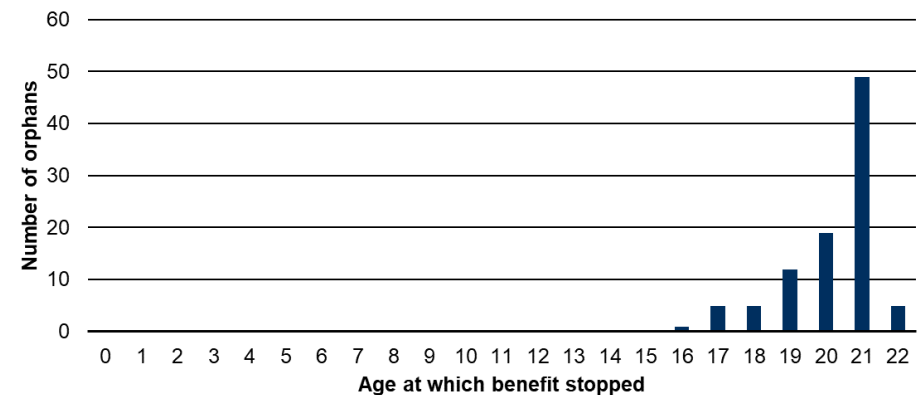
The average age at termination was approximately 18.6 years, which is virtually unchanged from the 18.4 calculated at the previous valuation.

Chart 5: Distribution of benefit termination age for benefit terminations on or after 29 April 1992

However, we also analysed the average age at termination for benefit terminations over the five years to the valuation date. From the orphans data provided, we identified 97 children whose benefits terminated on or after 31 December 2015. The distribution of age at termination for these 97 children is shown in chart 6.

Chart 6: Distribution of benefit termination age for benefit terminations on or after 31 December 2015

This analysis suggests a much higher average age at termination of approximately 20.7 years, which is virtually unchanged from the average age of termination of 21.0 years for children whose benefits terminated between 1 January 2011 and 31 December 2015. This is surely due to a larger number of children remaining in full-time education now compared with the past.

Given there is little change since the previous valuation, we have made no change to the assumed decrement rates at this valuation (ie the rates are broadly based on smoothing the experience from the full data set from 1992 to 2020). However, if the trend for orphans remaining in full time education for longer continues over the next five years, then we may consider increasing the assumed average age at termination at the next valuation (and base our assumed rates on the more recent data only). Section 9 of this report showed the sensitivity of the figures to changes in this assumption.

2. Mortality of Union Members

The S2NA tables used for the previous valuation are based on pension scheme mortality experience around the year 2011.

Following analysis of Union members' mortality experience, at the previous valuation the S2NA light table for males and the S2NA table for females with CMI 2015 core projections and a long term-rate of improvement of 1.5% pa were used for estimating the number of deaths to reflect the lighter observed mortality.

At this valuation we have investigated what further changes might be made to reflect the observed mortality experience over the inter-valuation period.

We were supplied with details of death claims recorded over the five calendar years 2016-2020. We note that this data is in respect of Union members only and not their spouses whereas the orphan data provided includes deaths of spouses. To make these two sets of data comparable, we have assumed that half of the deaths resulting in new orphan beneficiaries in the orphan data were due to Union members dying and half were due to their spouses dying. This information was combined with details of death claims recorded over the previous twenty-five calendar years obtained at the previous five valuations, and data about the Union's membership, to enable us to analyse the mortality experience over the thirty calendar years 1991-2020.

Once a member has claimed their Union Retirement Benefit they lose any rights to a death claim. Thus, at older ages – using claims data only – the mortality of members would be underestimated. However, at the principal ages that orphans' benefits are likely to arise, we are satisfied that these details provide a firm basis to test the mortality of members.

For the purposes of our mortality analysis, we have compared the observed mortality with the expected mortality (assuming 83% of Union members are male, in line with the actual proportion at the valuation date) under both the 2015 and 2020 assumptions. This analysis is presented in chart 7.

Chart 7: Actual versus expected deaths – 1991-2020
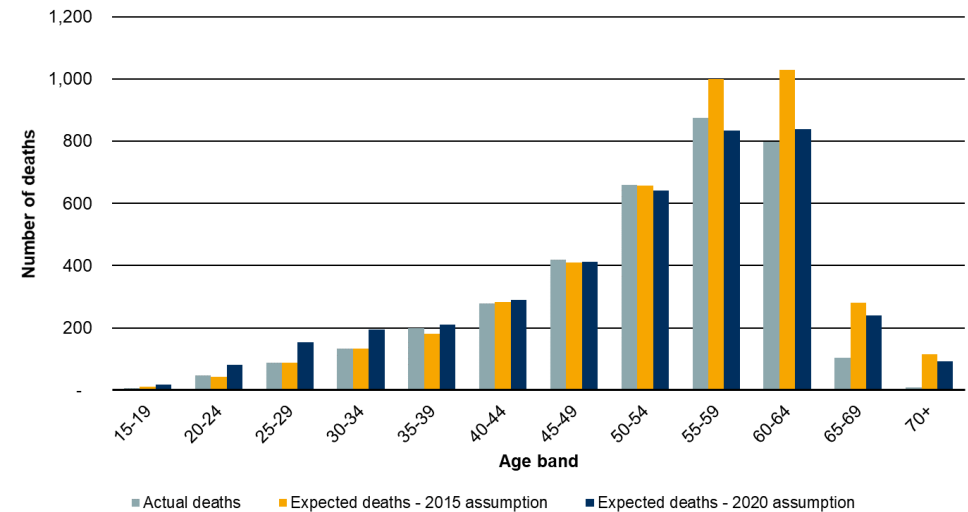
At the ages between 35 and 55, the key population for this valuation, the experience is broadly in line with the 2020 assumption.

Supported by the above analysis, for this valuation I have adopted the S3NA light table for males and 80% of the S3NA table for females with CMI 2020 core projections and a long-term rate of improvement of 1.5% pa.

The CMI 2020 projections introduce three new parameters when compared with the 2015 projections:

- The smoothing parameter "S" determines how much weight is placed on more recent data, with a lower value of S giving less smoothing and hence more weight to recent UK mortality experience. We have used the core parameter S=7 for this valuation.

- The additional initial improvement parameter "A" allows users to model mortality improvements currently being observed in different populations. A parameter higher than 0% means that life expectancies in the population are assumed to be higher than for the total population of England and Wales. We have assumed that Union members experience similar mortality rates to the population of England and Wales and therefore have used the core parameter of 0% for this valuation.

- As a result of the Covid-19 pandemic a third parameter has been introduced "w2020". This parameter determines how much weight is given to the 2020 death data, which includes deaths due to the pandemic. The pandemic has resulted in increased uncertainty with regard to future mortality projections. Mortality rates in England and Wales were higher in 2020 and 2021 (to date and despite the high vaccination rates) than 2019, due to the direct and indirect consequences of the pandemic, but the lasting impact of the pandemic on mortality rates remains unclear. We have therefore used the core parameter w2020=0% for this valuation, which gives no weight to 2020 mortality experience, given the uncertainty surrounding the long-term effects of the pandemic on mortality rates. We will review this assumption at the next valuation when the impact of the pandemic may be better assessed.

Overall, the updated mortality assumption results in increased assumed life expectancy compared with the previous assumption. However, it retains a significant margin at most ages against the risk of higher future levels of mortality amongst the membership versus that experienced during 2016-20 (ie mortality experience over the last five years has been considerably lighter than over the full 30 year period shown in the chart above). We believe this is prudent given the uncertainty surrounding the impact of the pandemic.

3. Average size of claim at death

The average claim size arising from a member or spouse death is related to:

- the proportion of deceased members or their spouses leaving orphans;
- the average number of orphans left by those who die leaving orphans; and
- the average age of orphans at the date of their parent's death.

All of the above factors may be expected to vary according to the age of the parent at death. As we did for the previous valuation, we have investigated each of the underlying factors separately. The results of our investigations, which covered the thirty calendar years 1991-2020, are set out in sub-sections 3.1 to 3.3 below.

3.1. Proportion of deceased members or their spouses leaving orphans

The results of our investigation are summarised in chart 8.

Chart 8: Proportion of deceased members or their spouses leaving orphans
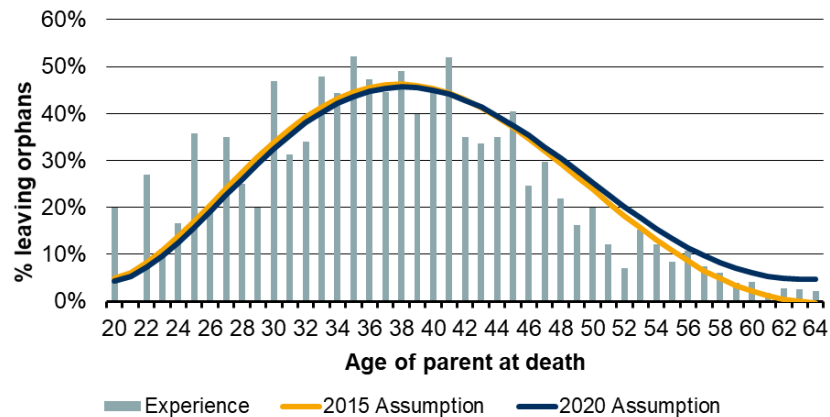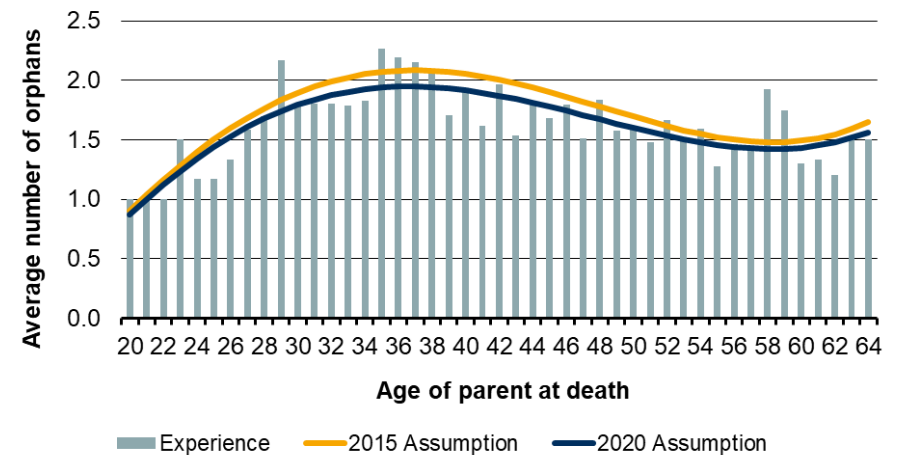

After smoothing, the percentage peaks at around 50% between ages 35 and 40 and then falls off rapidly to around 3% at the higher ages. The percentages we have assumed for this valuation are shown in blue, with the percentages assumed at the previous valuation shown in orange. As can be seen, the new

assumptions are broadly the same as the assumptions adopted for the previous valuation.

3.2. Average number of orphans left by those who die leaving orphans

The results of our investigation, based on the children's details provided, are summarised in chart 9.

Chart 9: Average number of orphans at death

After smoothing, the number peaks at around 2.0 at age 37 and then falls off gradually towards around 1.5 at the higher ages. The average numbers of orphans we have assumed for this valuation are shown in blue, with the numbers assumed at the previous valuation being shown in orange. Overall, the new assumptions assume slightly fewer orphans are left by those who die leaving orphans, reflecting the additional experience since 2015.

3.3. Average age of orphans at date of parent's death

The results of our investigation, based on the children's details provided, are summarised in chart 10.
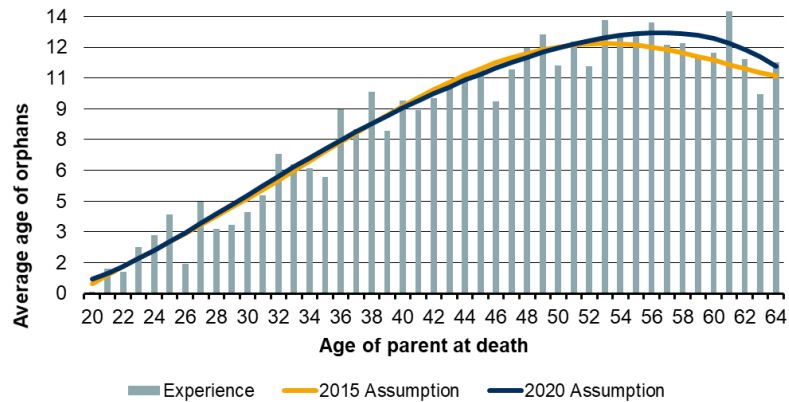
Chart 10: Average age of orphans on parent's death

The average age of orphans increases rapidly at younger ages of death. But the rate of increase slows, until the average age levels off at around 13 for parents who die at age 55, and then begins to fall. The average ages of orphans we have assumed for this valuation are shown in blue, with the averages assumed at the previous valuation being shown in orange. The new assumptions are broadly the same as the assumptions adopted for the previous valuation.

Appendix 2 – Actuarial assumptions

In calculating the funding target, and the contributions needed to maintain funding at that level, we need to make certain assumptions. The assumptions adopted are, except where noted, the same as were used for the valuation five years ago.

1. Interest

A rate of interest of 1.1% pa (2015: 1.5% pa) has been assumed.

No investments were directly allocated to the Fund. Investment income is credited to the Fund as a direct percentage of the size of the Fund to the Union's total funds.

Over the period since the previous valuation, the average rate of return credited to the Fund was c1.1% pa. Accordingly, we consider 1.1% pa to be a reasonable long-term assumption.

At the previous valuation, a higher rate of interest of 1.5% pa was assumed. The assumption now adopted is a more cautious assumption.

2. Benefit termination age

The following annual orphan decrement rates have been assumed based on the data provided about termination age.

Age	Percentage of beneficiaries ceasing payment (% pa)
0 - 14	0.5
15 - 17	5
18 - 20	10
21	60
22	100

These assumptions are unchanged from the previous valuation and give an average benefit termination age of 18.9 for an orphan aged 0 at the member or spouse's death.

3. Age and sex of spouse

An orphan benefit is paid if a member's spouse dies.

As 83% of Union members are male, for the purposes of our valuation we have assumed that members are male, spouses are female and wives are three years younger than their husbands.

4. Mortality of Union members and their spouses

As discussed in Appendix 1, for this valuation we have assumed that the mortality of Union members will follow the mortality of male lives under the S3NA light table with CMI 2020 core projections and a long-term rate of improvement of 1.5% pa. The mortality of spouses is assumed to follow the mortality of female lives under 80% of the S3NA table with CMI 2020 core projections and a long term rate of improvement of 1.5% pa. At the previous valuation we assumed mortality would follow the S2NA light table for males and 80% of the S2NA table for females with CMI 2015 core projections and a long-term rate of improvement of 1.5% pa. This update is to reflect the most recently published tables and projections and is justified by the observed mortality experience.

5. Average size of claim at death

The average size of claims, varying according to the age of the parent at date of death, have been estimated from the actual experience of the Fund, by expressing the average claim size as a function of the proportion of deceased members leaving orphans, the average number of orphans left by those who die leaving orphans, and the average age of orphans at the date of their parent's death.

Details of the assumptions adopted for each component are given in section 6 of my report and in Appendix 2 above.

6. Retirement age

A retirement age of 65 has been assumed. As a result, Union members aged over 65 have been excluded from the valuation.

7. New entrants and early withdrawals

It has been assumed that the current Union members will continue to contribute to the Fund until death or retirement at age 65.

No explicit allowance has been made for new entrants or the possibility of early withdrawal from membership of the Union. However, there is an implicit allowance for membership turnover in that under the Projected Unit methodology adopted the required contribution rate will only remain stable if the age distribution of the membership remains stable due to younger new entrants replacing older members when they retire or withdraw.

8. Percentage of contributing members

For this valuation, we have assumed that 100% of Union members under age 65 pay contributions to the Fund since we understand that members no longer have the option to opt out of contributing to the Fund. At the previous valuation, we made the same assumption.

9. Expenses

No specific allowance is included in the valuation for future expenses. As noted earlier, in recent years these have been borne entirely by the Union.

10. Summary

The assumptions adopted for this valuation are generally slightly less cautious than those adopted for the previous valuation (with the exception of the discount rate).

In my opinion these assumptions remain prudent overall.

Appendix 3 – Some risks faced by the fund

Risk	Comments
Union	The Union is not able to make the required contributions, and in particular is not able to pay increased contributions if experience is unfavourable.
Investment returns	Future investment returns credited to the Fund are lower than assumed. The greater the allowance made in the funding target calculation for future investment returns, the greater the risk that those returns are not achieved.
Mortality	More Union members or their spouses die than assumed. In particular, no allowance has been made for the impacts of the Covid-19 pandemic, given the uncertainty around its long-term impacts on life expectancy, and no allowance has been made for specific risks, such as climate change, so it is possible that there are significantly more deaths over the coming years than assumed.
Orphan benefit termination age	The average age at which orphans' benefits cease is higher than assumed.
Parent %	A higher % of deceased members or their spouses leave orphans than assumed.
Average number of orphans	The average number of orphans left by deceased parents is higher than assumed.
Average age of orphans	The average age of orphans left by deceased parents is lower than assumed.