

To : **M. van der Beek (ONE-Dyas B.V.)**
From : **K.F. Kauffman (MARIN)**
CC : **Y. Koldenhof (MARIN)**
Date : **2021-12-17**

Project No. : **32287.601**
Subject : **Preceding memo for re-run collision risk study platform N5-A**

Contents

1	INTRODUCTION.....	2
2	ANALYSES	3
2.1	“Old” and “new” location in relation to the traffic lane.....	3
2.2	Dimension platform.....	3
2.3	Traffic intensity between the initial run and re-run.....	4
2.4	Update Basic Accident Rates of the model	5
2.5	Comparison collision risk for one month of data	5
3	SUMMARY	7

1 INTRODUCTION

By an e-mail (dd. 11 November 2021) ONE DYAS requested MARIN to provide a proposal for a re-run on the ship collision risk study for platform N5-A [Ref 1.]. This re-run can only be performed in January 2022, since ONEDYAS needed a first quick implication of the re-run results MARIN indicated to draw up a short preceding memo with a prediction of the expected outcomes.

This memo qualitatively compares the results for the “old” location with the “new” location. This does not mean a complete re-run, but an first estimation of the effects on the expected collision frequencies of the new platform location based on a map of the traffic situation around the locations.

Next to the changed location ONEDYAS also requested a re-run based on the most recent traffic data. This will also influence the results of the ship-collision frequencies.

Table 1-1 shows the position, dimension and orientation of platform N5-A for the calculated position [Ref 2.] and proposed new location to be used in the re-run.

Table 1-1 Positions, dimension and orientation of platform N5-A for the calculated position and proposed re-run

	Position (WGS84)		Length (m)	Width (m)	Orientation
	Latitude	Longitude			
N5-A minimum (calculated)	53°41'29.742	6°21'18.497	62	35	270°
N5-A maximum (calculated)	53°41'29.742	6°21'18.497	153	78	270°
N5-A (re-run)	53°41'03.718	6°21'32.188	62	39	270°

2 ANALYSES

The first estimation of the effect of the new location and dimensions on the expected collision frequency is done based on the following aspects:

- Change of location compared to the main traffic routes around the location
- Change of the dimensions of the new platform
- Change in traffic-data
- Change in basic accident frequencies for the new AIS-data set.

2.1 “Old” and “new” location in relation to the traffic lane

The new location for platform N5-A is situated 26 minutes southwards and 4 minutes eastwards compared to the initial run (Table 1-1). This means that the new location is further away from the Northern traffic lane Terschelling-German bight and slightly closer to vessels sailing from and to the Northern Deep-Water route and the approach to the Ems (Figure 2-1).

The main contribution to the collision risk comes from non-route bound vessels in the area and the vessels in the “route” sailing from and to the approach of the Ems. Therefor only looking at the change of location it can be assumed that the expected collision frequency will increase. However since the change is not much the increase will be small.

2.2 Dimension platform

The dimensions for the new location (re-run) almost corresponds to the calculated N5-A minimum (see Table 1-1). The proposed length is the same and 4 meters wider. This slight increase in dimensions of the platform should not lead to a significant increase in collision frequency.

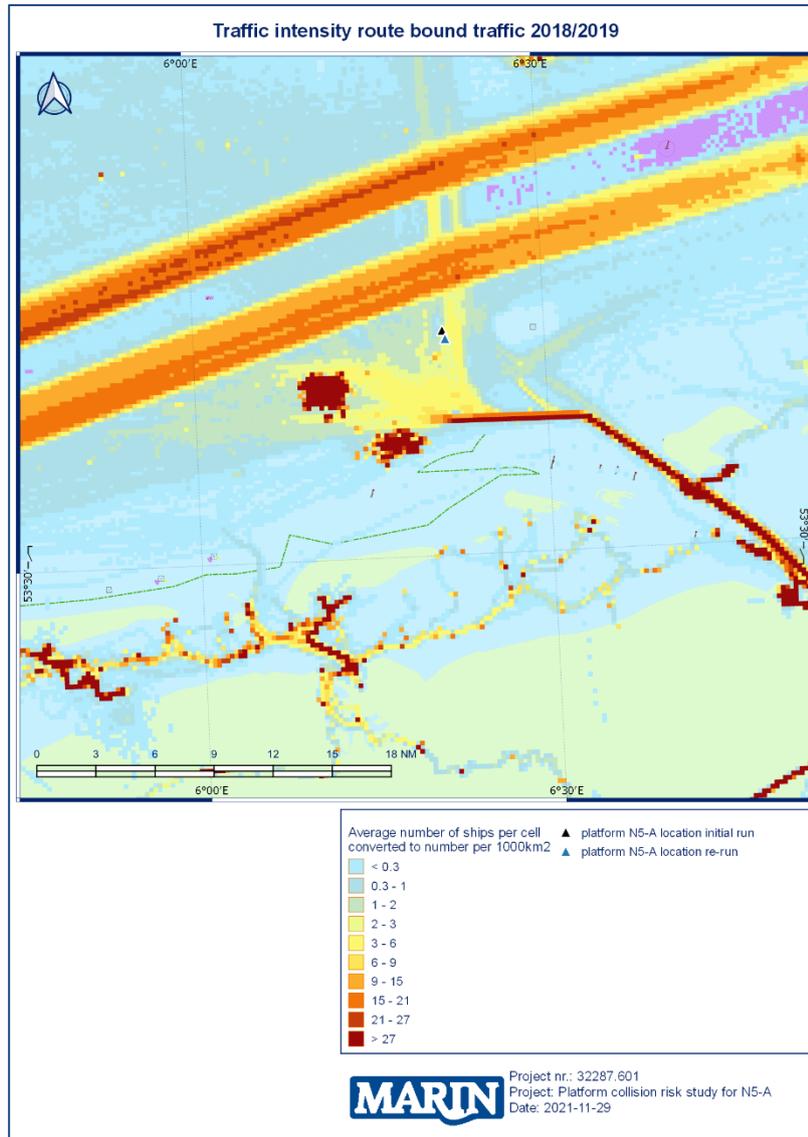


Figure 2-1 "Old" and "new" location for platform N5-A in relation to the traffic lane

2.3 Traffic intensity between the initial run and re-run

For the re-run of the new location more recent AIS-data will be used, so instead of the AIS-data for 2017 and 2018 the AIS-data for 2019 and 2020 will be used for the calculation. This will also influence the results, since the traffic is the main input factor for the calculations. However the intensity of shipping does not vary much over the different years. No details traffic analysis of this specific area is available, however in Figure 2-2 two shipping density maps are shown of the area, one for 2018 and one for 2020. There is some change visible in the spreading of the vessels, but this is mainly the spread of so-called non-route bound vessels, like fishing vessels and work vessels in the area. For the re-run also 2019 will be taken into account, to rule out any possible effect of COVID19-pandemic on the traffic flows. So the possible change of traffic, as a result of the use of more recent AIS-data will be limited.

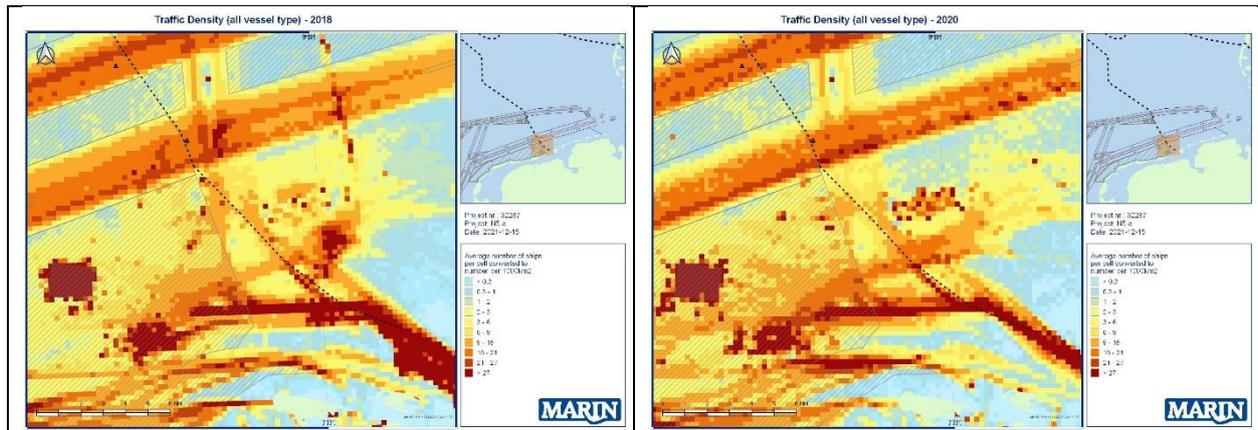


Figure 2-2 Traffic Density 2018 and 2020

2.4 Update Basic Accident Rates of the model

After the study for ONEDYAS [Ref 2.] had been delivered in 2019, the basic accident rates used in the model were updated, based on new information and for the new list of vessels sailing on the North Sea. During this update a sensitivity analysis showed an increase in the expected number of collision frequencies, especially for ramming.

So the model has been updated with the latest data on basic accident rates, which is higher than the frequency used in the 2019 model and will result in a higher collision frequency.

2.5 Comparison collision risk for one month of data

As preparation for the re-run in January 2022 a quick first run was made for only one month (July) and different years. For this first re-run the collision risk is determined for the “old” and “new” location (see Table 2-1). These raw figures have not been processed in detail and are not corrected for work traffic in the 500m buffer zone around the proposed platform location. Also the numbers are based on the “old” basic accident rates (so the model set-up used in 2019 was used to make this quick scan). The results presented in this memo are only intended to give a quick impression of change in time (dataset) and location.

Table 2-1 shows the expected number of collisions per year (based on only one month of data) for the “new” and “old” location for different years. An average (per year) over two combined years Table 2-2.

The figures show a decrease in time for the collision risk at the “old location”, especially in the transition from 2018 (one every 13.5 year) to 2019 (one every 18.3 year). This is in line with the traffic intensity analyses in paragraph 2.3. In 2020 the collision risk increases again (one every 13.7 year).

For the “new location” there is also a decrease in collision risk in July 2019 (once every 16.3 year) but less in comparison with the “old location” in the same period (one every 18.3 year). It seems that the change in platform location has a negative impact on the collision risk. In July 2020 the collision increases to once every 12.5 year.

Table 2-2 summarizes the average collision risk for July in 2017/2018 and 2019/2020. Overall there is an average decrease in collision risk in 2019/2020, but for the “new” location the decrease is less compared to the “old” location.

Table 2-1 Collision risk for N5-A minimum “old location” and “new location” for one month July. These raw figures have not been processed and are not corrected for work traffic in the 500m buffer zone around the proposed platform location.

Location	Year / month	Drifting	Ramming	Total	One every ... year
N5-A minimum “old location”	y2017m07	2.81E-02	6.21E-02	9.02E-02	11.1
N5-A minimum “old location”	y2018m07	9.77E-03	6.43E-02	7.41E-02	13.5
N5-A minimum “old location”	y2019m07	5.32E-03	4.94E-02	5.47E-02	18.3
N5-A minimum “old location”	y2020m07	7.80E-03	6.52E-02	7.30E-02	13.7
N5-A “new location”	y2019m07	5.55E-03	5.60E-02	6.15E-02	16.3
N5-A “new location”	y2020m07	8.74E-03	7.13E-02	8.01E-02	12.5

Table 2-2 Average collision risk for N5-A minimum “old location” and “new location” for one month July. These raw figures have not been processed and are not corrected for work traffic in the 500m buffer zone around the proposed platform location.

Location	Year / month	Drifting	Ramming	Total	One every ... year
N5-A minimum “old location”	y2017m07&y2018m07	1.89E-02	6.32E-02	8.22E-02	12.2
N5-A minimum “old location”	y2019m07&y2020m07	6.56E-03	5.73E-02	6.39E-02	15.7
N5-A “new location”	y2019m07&y2020m07	7.15E-03	6.37E-02	7.08E-02	14.1

3 SUMMARY

This memo has qualitatively assessed the new proposed location of the N05-A installation for ship collision risks. A ship collision risk study was carried out in 2019 for the old location. The new location is situated 26 minutes southwards and 4 minutes eastwards compared to the old location. This assessment has taken into account:

- The new location in relation to the traffic lane;
- The new dimensions of the N05-A installation;
- Traffic intensity between the initial run and re-run;
- Updated Basic Accident Rate;
- Newer AIS data (raw figures only).

Table 3-1 summarizes the analyses for the possible expected effect on the collision frequencies for the N5-A platform as a result of a new location, adjusted dimensions of the platform and a more recent AIS-data set.

The different aspects are scored individual and a first quick scan has been made for only one month of data (for different years). This first quick-scan has been done only to assess the effect of the new position and recent traffic data and shows a small decrease in the expected collision frequencies.

A complete re-run will be done January 2022, which will use an updated (higher) basic accident rate compared to the 2019 model.

It is however expected that usage of the new basic accident rate will nullify the decrease and may cause an overall increase. It must be emphasised that this is a result of a change in the model and is not directly caused by the dimension or location of the platform or from new AIS data. It is nevertheless expected that the collision risk remains in the same order of magnitude.

Table 3-1 Summary of analyses for the “new” platform location regarding the proposed re-run.

Analyses	Increase / decrease collision risk
“Old” and “new” location in relation to the traffic lane	Small increase
Dimension platform	(very) small increase
Traffic intensity between the initial run and re-run	No real impact expected
Update Basic Accident Rate	Increase
Comparison collision risk for July (quick scan based on only change of position and AIS-traffic database)	Small decrease

REFERENCES

- [Ref 1.] MARIN, Collision risk study for platform N5-A, proposal No. 32287.601/1, 25 November 2021.

- [Ref 2.] MARIN, Platform collision risk study for N5-A, Report Nr. 32287-1_MO-rev.1, 12 December 2019.

- [Ref 3.] MARIN, Sea Shipping Emissions 2019: Netherlands Continental Shelf, 12 Miles Zone and Port areas. Report Nr. 33052-1_MO-rev.1, 9 March 2021.