

BRIEF SUMMARY OF PROJECTS CARRIED OUT
BY
THE HYDRAULICS RESEARCH INSTITUTE
River navigation

1- Naga-Hamadi Lock

Consultant : HRI

Period : 1987 - 1989

The study objective was to solve the navigation problems at the entrance and outlet of the lock. A navigational passage should be checked. Both erosion and sedimentation in the navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection, bathymetric surveys and the construction of a hydraulic scale model to study the possible erosion and/or sedimentation in the passage and to check the flow pattern in the field of the lock.

2- Bani Swif Bridge

Consultant : HRI

Period : 1988 – 1989

The study objective was to solve the navigational problems downstream the bridge. Both erosion and sedimentation had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection, bathymetric surveys and a scale model was constructed represent the problem and to check the different solution techniques. Different structure type and location were checked and the required amount of dredging was determined to fulfill the safe navigational passage requirements.

3- El-Menia Bridge

Consultant : HRI

Period : 1988 – 1989

The study objective was to solve the existing problems upstream the navigation vent of the bridge. Both erosion and sedimentation in the navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection, bathymetric surveys and a scale model was constructed to represent the problem and to check the different solution techniques. Different structure type and location were checked and the required amount of dredging was determined to fulfill the safe navigational passage requirements.

4- Souhag Bridge

Consultant : HRI

Period : 1988 - 1989

The study objective was to solve the navigational problems downstream the bridge. Both erosion and sedimentation in the navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection, bathymetric surveys and a scale model was constructed to represent the problem and to check the different solution techniques. Different structure type and location were checked and the required amount of dredging was determined to fulfill the safe navigational passage requirements.

5- Hwata Zone (Assuit)

Consultant : HRI

Period : 1988 - 1989

The study objective was to solve the navigational problems at the area. Both erosion and sedimentation in the navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection, bathymetric surveys and desk study to check the different solution techniques. Different structure type and location were checked and the required amount of dredging was determined to fulfill the safe navigational passage requirements.

6- Selwa Zone (Aswan)

Consultant : HRI

Period : 1988 - 1989

The study objective was to solve the navigational problems in the zone (30 km north of Aswan). Both erosion and sedimentation in the navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection, bathymetric surveys and a scale model was constructed to represent the problem and to check the different solution techniques. Different structure type and location were checked and the required amount of dredging was determined to fulfill the navigational passage requirements.

7- Nag Abou Aid Zone (Aswan)

Consultant : HRI

Period : 1988 - 1989

The study objective was to solve the navigational problems in the zone. Both erosion and sedimentation in the navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The studies comprised field investigations, data collection, bathymetric surveys and desk study was conducted to check the different solution techniques. Different structure type and location were checked and the required amount of dredging was determined to fulfill the safe navigational passage requirements.

8- Navigation Problems at Naga Hammadi Railway Bridge

Consultant : HRI

Period : 1991 - 1992

The study objective was to plan a navigational passage to join the area between the old Naga-Hammadi bridge and the new railway bridge.

Both erosion and sedimentation in the navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection, bathymetric surveys and desk study was conducted to check the different solution techniques. Different structure type and location were checked and the required amount of dredging was determined to fulfill the safe navigational passage requirements.

9- Improvement of the Navigability of the Damietta Branch

Consultant : HRI

Period : 1991 - 1992

The study objective was to convert the Damietta branch into a first degree navigable channel. The whole branch had to be checked from the morpho-dynamic point of view, the existing structures should be rechecked to allow for the new requirements.

The study comprised field investigations, data collection, bathymetric surveys and a one dimensional mathematical model representing the whole branch was constructed to determine the need of new hydraulic structures and the required amount of dredging was determined to fulfill the navigational passage requirements.

10- Bahareef Zone (Aswan)

Consultant : HRI

Period : 1992

The study objective was to solve the navigational problems in the zone from Aswan city to El-Gaafra village. Both erosion and sedimentation in the navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection(water current velocity, bed samples and hydrological data) , bathymetric surveys and desk study was conducted to check the different solution techniques. Different structure type and location were checked and the required amount of dredging was determined to fulfill the safe navigational passage requirements.

11- Navigation Difficulties at Assuit Barrage Lock

Consultant : HRI

Period : 1992 -1993

The study objective was to overcome the navigation problems in the lock zone. It was required to determine the safe passage for crossing the lock. This passage should be morphologically stable, thus erosion and sedimentation had to be prevented.

The study comprised field investigations, data collection, bathymetric surveys of 4 km length were carried out and desk study was conducted to achieve sound solution.

12- North Luxor Navigation problems

Consultant : HRI

Period : 1993

The study objective was to solve the navigational problems in a 4 km long zone. Both erosion and sedimentation in the navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection(water current velocity, bed samples and hydrological data) , bathymetric surveys and desk study was conducted to check the different solution techniques. Different structure type and location were checked and the required amount of dredging was determined to fulfill the safe navigational passage requirements.

13- Awlad El-Sheikh Zone (Aswan)

Consultant : HRI

Period : 1993

The study objective was to solve the navigational problems in a 4.6 km long zone. Both erosion and sedimentation in the navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection(water current velocity, bed samples and hydrological data) , bathymetric surveys and desk study was conducted to check the different solution techniques. Different structure type and location were checked and the required amount of dredging was determined to fulfill the safe navigational passage requirements.

14- Bani Mazar (Menia)

Consultant : Nile ReseaInstitute.

Period : 1993 -1994

The study objective was to solve the navigational problems in the zone (6 km length). Both erosion and sedimentation in the navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection, bathymetric surveys and a scale model operating in a morpho-dynamic way was constructed to represent the problem area, study the possible morphological changes and to check the different solution techniques. Different structure type and location were checked and the required amount of dredging was determined to fulfill the safe navigational passage requirements.

15- Armant Zone (Quna)

Consultant : HRI

Period : 1993 – 1994

The study objective was to select the best passage with respect to the amount of dredging and the required hydraulic structures. Both erosion and sedimentation in the selected navigation passage had to be prevented under different river flow conditions and the required navigational properties should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigations, data collection, bathymetric surveys and the construction of a hydraulic scale model working in a morpho-dynamic manner to study the possible erosion and/or sedimentation and to check the different solution techniques. Different

structures types and locations were checked and the required amount of dredging was determined to fulfill the safe navigational passage requirements.

16- New Lock at km 100 of El-Nubaria Canal

Consultant : River Transport Authority

Period : 1997- 1998

The study objective was to find the best alignment of a new navigation lock (17 m x 120 m) on El-Nubaria canal parallel to the existing one at km 100.0.

The study comprised field investigations, data collection, bathymetric surveys of 6 km length were carried out and desk study for various alternatives.

17- Construction Additional Navigation Lock To New Esna Barrage

Consultant : HRI

Period : 2001 -2002

The study main objective was to construct additional navigation lock next to the old one and has the same dimensions to satisfy the increasing number of ships and vessels in the Nile.

The study comprised undistorted physical model with scale 1:60. The model targets were to study vortices formation upstream and downstream the lock and influence on sedimentation, study the traverse velocities so as not to affect on ships. The study included measuring water velocity distribution and traverse velocities by dividing the lock upstream area to 13.0 cross-sections and the downstream area to 14.0 cross-sections. The study found that the traverse velocities downstream the lock were higher than the allowable values. Therefore, the suggested design was modified by increasing length of the wing wall located between the old lock and power plant with 40 m.

18- Naga Hammady Lock

Consultant :HRI

Period : 1987 – 1989

The study objective was to solve the navigation problems at the entrance and outlet of the lock. The navigational channel should be checked. Both erosion and sedimentation in the navigation channel had to be prevented under different river flow conditions.

The study comprised field investigation, data collection, bathymetric surveys, and the construction of a hydraulic scale model to study the possible erosion and/or sedimentation in the channel and to check the flow pattern inside the lock.

19- Navigation Passage at Benban (Aswan)

Consultant : HRI

Period : 1988 – 1989

The study objective was to obtain a stable navigation channel at Benban. Both erosion and sedimentation had to be prevented for different River flow conditions.

The study comprised field investigation, data collection, bathymetric survey, and desk work to choose the required hydraulic structure and the amount of dredging for channel maintenance.

20- Bani Swif Bridge

Consultant :HRI

Period : 1988 – 1989

The study objective was to solve the navigational problems downstream the bridge. Both erosion and sedimentation had to be prevented under different flow conditions and to ensure safe navigation.

The study comprised field investigation, data collection, bathymetric survey, and a scale model. Different structure types and locations were studied and the required amount of dredging was determined to fulfill safe navigational.

21- El-Menia Bridge

Consultant :HRI

Period : 1988 – 1989

The study objective was to solve the problems upstream the navigation vent of the bridge. Both erosion and sedimentation in the navigation channel had to be prevented under different river flow conditions. The required navigational properties were to be checked to ensure safe navigation.

The study comprised field investigation, data collection, and bathymetric surveys. A scale model was constructed to represent the problem and to check different solutions. Different structure types and locations were investigated and the required amount of dredging was determined to fulfill the safe navigation.

22- Souhag Bridge

Consultant :HRI

Period : 1988 – 1989

The study objective was to solve the navigational problems downstream the bridge. Both erosion and sedimentation in the navigation channel had to be prevented under different river flow conditions. The required navigational properties were to be checked to ensure safe navigation.

The study comprised field investigation, data collection, and bathymetric surveys. A scale model was constructed to represent the problem and to check the different solutions. Different structure types and locations were investigated and the required amount of dredging was determined to fulfill safe navigational.

23- Hwata Zone (Assuit)

Consultant :HRI

Period : 1988 – 1989

The study objective was to solve the navigational problems at the area. Both erosion and sedimentation in the navigation channel had to be prevented under different river flow conditions. The navigational requirements should be checked to ensure a suitable passage and safe navigation.

The study comprised field investigation, data collection, bathymetric surveys, and desk work to check different solutions. Different structure types and locations were considered and the required amount of dredging was determined to fulfill safe navigation.

24- Selwa Zone (Aswan)

Consultant :HRI

Period : 1988 – 1989

The study objective was to solve the navigational problems in a river reach 30 km north of Aswan. Both erosion and sedimentation in the navigation channel had to be prevented under different river flow conditions. The navigational requirements should be checked to ensure safe navigation.

The study comprised field investigation, data collection, and bathymetric surveys. A scale model was constructed to represent the problem and to check the different solutions. Different structure types and locations were checked and the required amount of dredging was determined to fulfill safe navigation.

25- Nag Abou Eid Area (Aswan)

Consultant :HRI

Period : 1988 – 1989

The study objective was to solve the navigational problems in the area. Both erosion and sedimentation in the navigation channel had to be prevented under different river flow conditions. The navigational requirements should be checked to ensure safe navigation.

The study comprised field investigation, data collection, bathymetric survey, and desk work. A scale model was conducted to check the different solutions. Different structure types and locations were investigated, and the required amount of dredging was determined to fulfill safe navigation.

26- Navigation Problems at Naga Hammady Railway Bridge

Consultant :HRI

Period : 1991-1992

The study objective was to plan a navigational channel in a river reach between the old Naga Hammady bridge and the new railway bridge. Both erosion and sedimentation in the navigation channel had to be prevented under different river flow conditions. The navigational requirements were to be checked to ensure a suitable passage and safe navigation.

The study comprised field investigation, data collection, bathymetric surveys and desk work. A scale model was conducted to check different solutions. Different structure types and locations were investigated and the required amount of dredging was determined to fulfill safe navigation.

27- Improvement of the Navigability of the Damietta Branch

Consultant :HRI

Period : 1991 – 1992

The study objective was to improve navigation in the Damietta branch. The whole branch had to be studied from the morpho-dynamic point of view, and the existing structures should be rechecked to a bed by the new requirements.

The study comprised field investigation, data collection, and bathymetric surveys. One dimensional mathematical model representing the whole branch was constructed to determine the need of new hydraulic structures, and the amount of dredging was required to fulfill the safe navigation was determined.

28- Bahareef Zone Area (Aswan)

Consultant :HRI

Period : 1992-1993

The study objective was to solve the navigational problems in the river reach between Aswan city and El-Gaafra village. Both erosion and sedimentation in the navigation channel had to be prevented under different river flow conditions. The navigational requirements were to be checked to ensure a safe navigation.

The study comprised field investigations, data collection (water current velocity, bed samples and hydrological data), bathymetric surveys, and desk work. A scale model was conducted to check the different solutions. Different structure types and locations were investigated and the required amount of dredging to fulfill safe navigation was determined.

29- Navigation Difficulties at Assuit Barrage Lock

Consultant :HRI

Period : 1992 – 1993

The study objective was to overcome the navigation problems in the lock area. It was required to determine the safe channel for crossing the lock. This channel should be morphologically stable, which means that erosion and sedimentation had to be prevented.

The study comprised field investigation, data collection, bathymetric surveys and desk work.

30- North Luxor Navigation Problems

Consultant :HRI

Period : 1993- 1994

The study objective was to solve the navigational problems in river reach. Both erosion and sedimentation in the navigation channel had to be prevented under different river flow conditions. The navigational requirements should be checked to ensure safe navigation.

The study comprised field investigations, data collection bathymetric surveys, and desk work to check different solutions. Different structure types and locations were investigated and the required amount of dredging was determined to fulfill safe navigation.

31- Awlad El-Sheikh Area (Aswan)

Consultant :HRI

Period : 1993-1994

The study objective was to solve the navigational problems in a 4.6 km river reach. Both

erosion and sedimentation in the navigation channel had to be prevented under different river flow conditions. The navigational requirement should be checked to ensure a suitable channel for safe navigation.

The study comprised field investigations, data collection (water current velocity, bed samples and hydrological data), bathymetric surveys, and desk work to check the different solutions. Different structure types and locations were investigated and the required amount of dredging was determined to fulfill safe navigation .

32- Bani Mazar (Menia)

Consultant : Nile Research Institute

Period : 1993 - 1994

The study objective was to solve the navigational problems in a river reach of length 6 km. Both erosion and sedimentation in the navigation channel had to be prevented under different river flow conditions. The navigational requirements were to be checked to ensure safe navigation.

The study comprised field investigation, data collection, and bathymetric surveys. A scale model operating in a morpho-dynamic way was constructed to represent the problem area, and the possible morphological changes, and to check the different solutions. Different structure types and locations were investigated and the required amount of dredging was determined to fulfill safe navigation.

33- Armant Area (Quna)

Consultant :HRI

Period : 1993-1994

The study objective was to select the best navigation channel with respect to the amount of dredging and the required hydraulic structures. Both erosion and sedimentation in the selected navigation channel had to be prevented under different river flow conditions. The navigational requirements were to be checked to ensure safe navigation.

The study comprised field requirement investigation, data collection, bathymetric surveys. A scale model was constructed working in a morpho-dynamic manner to study the possible erosion and / or sedimentation and to check the different solutions techniques. Different structure types and locations were investigation and the required amount of dredging was determined to fulfill safe navigation.

34- New Lock at km 100 an El-Nubaria Canal

Consultant : River Transport Authority

Period : 1997- 1998

The study objective was to find out the best alignment of a new navigation lock (17m x 120m) on El-Nubaria canal parallel to the existing one .

The study comprised field investigation, data collection, bathymetric survey and desk work .