THE ITALIAN COAST GUARD SURVEILLANCE AND SPECIFIC ENVIRONMENTAL ACTIVITIES. RESULTS OF THE NATIONAL CAMPAIGN

Federica Galeano, Clarissa Legari, Luca Patrizio, Angelo Villapiano, Tiziana Sinesi, Maura Pisconti

Abstract: Over the years, specific environmental maritime police campaigns have been thoroughly planned and carried out through the use of ITCG specialized units aiming at protecting the marine environment, in order to discover, analyze and repress environmental-harming activities. In 2023 the Environmental National Coordination Center planned a national campaign to prevent marine pollution and deployed also the Italian Coast Guard Environmental Analysis Laboratory. This operation was called «Clean Waters» and took place from 27th December 2022 to 30th April 2023: it involved all local Coast Guard offices and mainly focused on sites which could generate wastewater discharges. Hundreds of checks were carried out on specific targets and 55 wastewater samples were sent to the laboratory for subsequent analysis. Samples of waste water were analyzed, in order to ascertain any exceeding limits imposed by Italian law and to counteract potential pollution of the Italian seas. On the samples received we performed approximately 2000 chemical-physical, chemical and microbiological analyses; 12 samples resulted "non-compliant" due to 20 exceedings limits set by the Legislative Decree 152/2006.

Keywords: Measurement Methods and Instruments

Federica Galeano, Italian Coast Guard, Italy, federica.galeano@mit.gov.it
Clarissa Legari, Italian Coast Guard Headquarters, Italy, clarissa.legari@mit.gov.it
Luca Patrizio, Italian Coast Guard Headquarters, Italy, luca.patrizio@mit.gov.it
Angelo Villapiano, Italian Coast Guard Headquarters, Italy, angelo.villapiano@mit.gov.it
Tiziana Sinesi, Italian Coast Guard - Livorno, Italy, tiziana.sinesi@mit.gov.it
Maura Pisconti, Italian Coast Guard, Italy, maura.pisconti@mit.gov.it

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Introduction

Over the years, specific environmental maritime police campaigns and complex operational activities have been thoroughly planned and carried out through the use of ITCG specialized units aiming at protecting the marine environment and the safeguard of the coasts and the biological resources, in order to discover, analyse and repress environmental-harming activities [2] [4].

In 2023 the Environmental National Coordination Centre planned a national campaign to prevent marine pollution and also deployed the Italian Coast Guard Environmental Analysis Laboratory. This campaign was called «Clean Waters» and took place from 27th December 2022 to 30th April 2023: it involved all local Coast Guard offices and mainly focused on sites which could generate waste water discharges likely to pollute the marine environmental matrices.

The operation aimed at protecting the marine and coastal environment through targeted control activities on the regularity of water discharges on the national territory, primarily through technical checks conducted by personnel qualified for sampling and personnel employed at the Coast Guard Laboratory for carrying out the analyses. The approach of decentralizing the sampling phase, already started and tested in the past, was therefore implemented [3].

The operation was divided into two distinct phases, one documentary and one operational. In the first phase - "documentary/ascertainment activity" - the territorial offices updated their waste censuses with the possible targets to be subjected to control, identifying, in their area of competence, the sites and production activities that could potentially produce waste water pollutants for the marine environment.

The types of discharges subjected to verification included: a) industrial waste discharges originating from shipyards − coastal depots − port facilities (for example, refineries, thermoelectric power plants, etc.) − car washes − laundries − swimming pools in sport-centers and hotel facilities or thermal spas − cheese factories − tanneries − paint factories and b) domestic waste water discharges coming from hotels, tourist villages and catering activities c) urban wastewater discharges − private and municipal purifier plants.

To identify the targets, open source applications available online and the technical reports relating to the remote sensing missions conducted by the Coast Guards aircraft were used, even prior to the CLEAN WATERS operation. Furthermore, each CG office involved acquired the documents related to environmental authorizations (for example discharge authorisation, single environmental authorization, integrated environmental authorization, agronomic use of sludge, use of waste water for fertigation, etc.) in an order to focus the control activity primarily on those establishments that hypothetically could lack them. Controls were also carried out on sites with all the authorizations, verifying their compliance with the provisions. Furthermore, important information was also acquired through the Chamber of Commerce's record, as well as by consulting the institutional pages of the relevant Authorities.

This first phase was carried out ensuring a confidential approach for the acquisition of documentation in order not to invalidate the subsequent operational phase.

In the second phase - "operational activity" - targeted checks and inspections regarding water discharges were carried out. Both the Marine Environmental Control Centres (MECC) for regional coordination and the Environmental Police Operational Units (EPOU) – present in all CG offices - were involved in carrying out the activities. The team was made up of at least one unit of CG personnel belonging to the EPOU, in possession of specific training and/or proven experience in environmental matters; and, where available, also at least one unit trained in "Surface Water and Marine Sediment Sampling Techniques"; both units were responsible for all activities among which inspections and sampling. To carry out the sampling, all personnel was trained through the documents available on-line - in particular the LAB_001 operational directive - the sampling techniques manual and the procedure to transport the samples, through a specialized company, to the CG Environmental Analysis Laboratory.

Joint activities have also been planned with other Police Forces operating locally and/or with the Authorities responsible for environmental control/monitoring (Provinces, Metropolitan Cities, ARPA), when the sites to inspect could be linked, due to their characteristics and typology, to individuals affiliated with criminal associations as well as to avoid compromising any ongoing investigations.

Regarding the use of the scientific units, each CG Office sent at least one sample to the Fiumicino Environmental Analysis Laboratory according to a shared calendar, developed in order to allow the correct management of the transport and acceptance of the samples for the subsequent execution of the analyses.

In this case, the operators sent a sample of waste water taken from the inputs into surface water or from the exit well of the selected purification plants.

The activities releasing huge quantities of urban or industrial waste water (for example companies specialized in dairy production) were subject of multiple inspections in the adjacent areas, even at night, with the aim of identifying any pipes installed illegally (so-called bypasses) to discharge the wastewater without preliminary passage through the pre-treatment systems or to reduce the flow rate so as to comply with the limits and requirements set out in the environmental authorisations.

Furthermore, observation, control and shadowing activities were organised aimed at having a complete picture of the situation external to these production facilities, in order to identify any suspicious movements (for example, companies that intend to deliver their liquid waste to unauthorized purifiers) and calibrate the number of operators to be used in the control phase according to the extension of the area to be inspected and the subjects operating there. To support the teams, the CCNA made tools available for immediate consultation such as updates to the environmental regulations and forms/checklists for conducting the inspection activity.

Materials and Methods

In order to assure the role of the Coast Guard as an operational instrument for the implementation of the functions regarding the protection of the marine and

coastal environment, on behalf of the Ministry of Environment, a complex "Environmental Strategy" has been drawn up and approved, characterizing the activities of marine environmental police carried out by the ITCG staff. As part of the environmental protection, the operation " CLEAN WATERS ", planned and coordinated by the Plans and Operations Department of ITCG Headquarters, provided a coordinated and synergical use of the specialist units to discover, analyse and immediately repress illicit phenomena that may affect the environment.

In the national operational “CLEAN WATERS” an important role was played by the Environmental Analysis Laboratory of the ITCG "CF (CP) Natale DE GRAZIA" – LAB.GC.

The Environmental Analysis Laboratory consists of 2 Mobile Environmental Laboratories (LAM) and a traditional Laboratory (LAB) located at Fiumicino CG Office [1]. The Laboratory is run by qualified biologists and duly trained technicians able to perform both the sampling and analytical phase, using LAM and LAB instruments. The Laboratory, thanks to its specialized organization, can operate in dual use: ITCG employs the LAM asset to carry out sampling activities and on field analysis, and LAB asset to perform the full range of analysis by using more advanced equipment to analyse the water samples provided by the local CG Offices. In December 2021 an important milestone was reached: the accreditation of the Laboratory Environmental Analysis "CF (CP) Natale DE GRAZIA", which is added to the quality certification ISO 9001, issued by RINA in 2013. ACCREDIA, Single National Accreditation Body, has issued the certificate attesting the competence, independence and impartiality of the Laboratory in compliance with the requirements of the technical standard UNI EN ISO IEC 17025 strengthening even more the validity of the analytical results obtained in the laboratory and used in administrative and criminal proceedings.

Results

During the environmental operation, 7770 activities on land and 1425 missions were carried out using naval vessels for a total of 39512 hours of activity divided into 4 time slots covering 24 hours.

The two time slots (06pm/midnight and midnight/06am) were mainly used for investigative activities and to monitor those sites where crimes were more likely to occur.

The data, summarized in the table (figure 1), highlights that the focus of the activity was centred on the port areas and in particular on the purifiers, sites which, in most cases, discharge waste water directly into the sea.

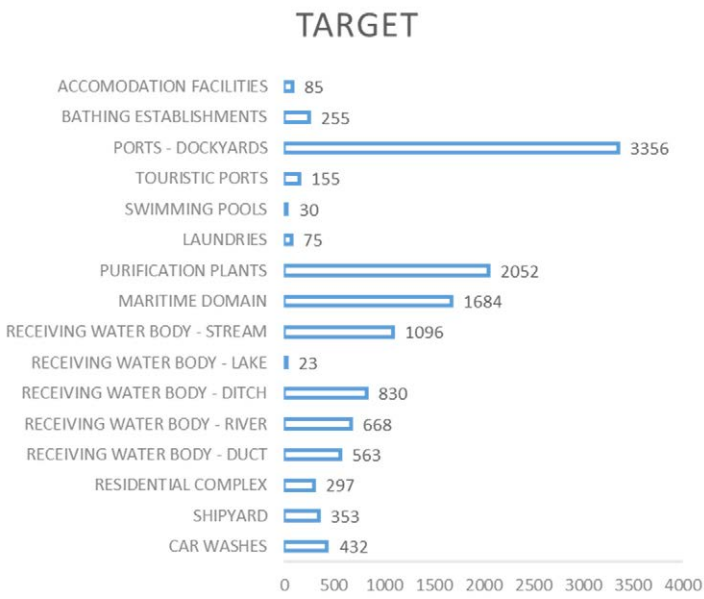

Figure 1 – Main target of the national operation “Clean waters”.

The over 2000 checks were distributed across three different types of purification plants, urban, domestic and industrial wastewater, as shown in the following graph (figure 2):

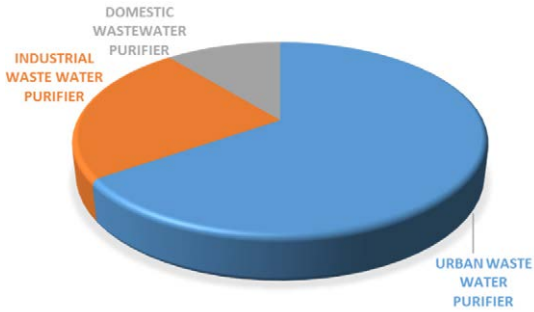

Figure 2 – Main type of purification plants checked.

This strategic choice was positively evaluated for the protection not only of surface water bodies and therefore of the delicate ecosystems of the marine-coastal environment, but also as a guarantee for the citizens due to the imminence of the summer season.

Overall, no. 17245 checks were conducted on water discharges, plus the other relevant activity carried out by local CG Offices, the outcome of which is reported:

- ✓ 9414 controls regarding the waste cycle;
- ✓ 11721 checks regarding the prevention/detection of pollution at sea.

Figure 3 – Main type of control.

Overall, during the «CLEAN WATERS» operation, 38,380 detailed checks were carried out along the entire national coastal strip (approximately 7.500 km) distributed as per the cartography below (figure 4).

Figure 4 – Ascertains distribution.

Following the activity in which were carried out, the owners of the companies were reported to the Judicial Authority the pertaining structures were seized and the process envisaged by the Environmental Law for the extinction of the contested crimes through the release of a prescription technically certified by the local ARPA was started. While the complex operation made some critical issues come to light, it also contributed to curbing some of the most environmentally damaging behaviours.

Environmental controls regarding discharges led to the investigation and reporting of 271 offences:

- 171 administrative;
- 100 penal.

63 people and 37 legal entities were reported to the Judicial Authority.

The main administrative sanctions contested are related to the lack of authorization to discharge domestic waste, exceeding the emission limit values set in the tables of the Environmental Law (T.U.A.) and failure to comply with the requirements indicated in the authorization provision, as reported below (figure 5).

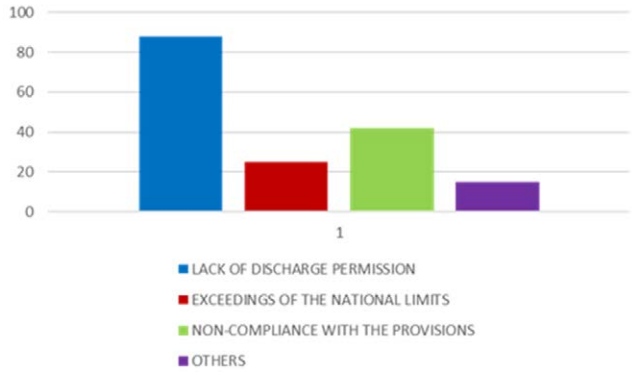

Figure 5 – Main penalties found.

The total amount of administrative sanctions issued varies between 485 000 € and 4 850 000 €. For this type of sanctions, as the legislator consider them particularly severe and harmful, no reduced payment is allowed. It is the responsibility of the competent authority (Region/Province/Metropolitan City/Municipality) to issue the injunction with the exact amount due.

The main crime reports sent to the competent Judicial Authority. concern the lack of authorization for the discharge of industrial wastewater and the discharges into the soil and subsoil in the absence of authorization or in non-compliance with the relevant instructions.

As part of the operation, the «CF (CP) Natale DE GRAZIA» Environmental Analysis Laboratory of the Coast Guard was deployed to continuously support the operational activities of the CG Offices which, according to the Action plan of the operation, carried out a series of samples - involving trained personnel - on

previously identified waste water, with subsequent sending of the samples. The refrigerated and controlled transport of the samples, according to the methods and timing required by technical regulations, was carried out by a highly specialized company, contracted by the ITCG General Headquarters.

The constant support granted by the laboratory staff has contributed to achieve the objective of consolidating skills and increasing the staff's capacity in managing the sampling, conservation and transport procedures of samples which represent critical phases of the analytical process.

Between January and April 2023, 54 samples were received at the laboratory, consisting of "waste water" matrix, mostly taken from the sampling point at the exit of purification plants. The correct application of the standardized sampling procedures and the efficiency of the transport chain guaranteed the validity of all the samples received for carrying out the analyses by the Laboratory personnel (figure 6), according to the standards set by the T.U.A. and from the APAT CNR IRSA Manual Man 29/2003 «Analytical methods for water».

Figure 6 – Environmental Analysis Laboratory personnel

12 out of the 54 samples received, on which approximately 2000 chemical-physical, chemical and microbiological analyses were performed, were found non-compliant. The analytical results allowed the detection of n. 20 exceeding the tabular limits provided for in the third part of Legislative Decree no. 152/2006 and/or individual environmental authorizations, divided as follows:

- ✓ n. 13 relating to chemical parameters (total nitrogen, ammoniacal nitrogen, nitrous nitrogen – nitrites, total surfactants and chlorides);
- ✓ n. 7 relating to the microbiological parameter *Escherichia coli*.

The verification of exceeding the legal limits was included in formal reports issued by the laboratory, and subsequently notified to the violators by the competent CG Office.

Discussion and Conclusion

The over 2000 checks carried out as part of the national CLEAN WATERS operation led to the detection of numerous crimes, both administrative and penal, regarding waste and in particular water discharges. The focus of the activity was centred on a critical sector in Italy such as purification; infact the selected targets

were mostly treatment plants located along the national coast which discharge waste water directly into the sea, therefore potentially more harmful to the marine and coastal environment.

The Coast Guard's activity, aimed at protecting delicate coastal ecosystems, contributed to the pursuit of the institutional objective assigned by the Ministry of the Environment and the results obtained confirmed the effectiveness of the strategic choice of the entire operation.

Furthermore, given the excellent results, a follow-up activity was also organized to strengthen the prevention and fight against marine pollution and increase surveillance in Marine Protected Areas as per the Agreement signed on 3rd November 2022 by the Minister of the Environment and Energy Security and the General Commandant of the Coast Guard.

The operational activity was carried out between 18th September 2023 and 10th November 2023, involving the Environmental Analysis Laboratory «C.F. (CP) Natale DE GRAZIA» employed in mobile (LAM) and traditional (LAB) operational set-up to carry out analyses on 19 samples of waste water matrix provided by the local CG Offices, in the most anthropized Marine Protected Areas.

The analyses carried out on these samples revealed some exceeding of the tabular limits indicated both in the Environmental Law (T.U.A.) and in the individual authorization documents; in particular, 12 non-conformities were found relating to the chemical parameters and 2 NC for the *E. coli* parameter, reported in the relevant test reports, used by the Commands to contest the offenses found.

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