

THE “ITALIAN PERIOD” OF THE WHITEHEAD TORPEDO FACTORY OF FIUME (RIJEKA) AND THE FOUNDATION IN LIVORNO OF WHITEHEAD MOTO FIDES (WMF - 1945) AND OF WHITEHEAD ALENIA SISTEMI SUBACQUEI (WASS –1995)

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FOREWORD

The “italian period” of the Whitehead Torpedo Factory of Fiume, goes from 24th January 1924 to 3rd May 1945, lasting altogether, a bit more than 21 years. As compared to the period of 150 years (associated to the celebration of the foundation of the *Fonderia Metalli*), or even to the period of 128 years (associated to the foundation of the *Whitehead Torpedo Factory*), it appears to be quite short and could give the idea of not being sufficiently significant and important for the Company.

But if we take a look to other aspects than simply to the duration of the period during which the Company was under the italian laws, was property of italian capitals and managed by italian staff, it may be noticed that the italian influence has been present in the life of the Company for a much longer period than that associated to the simple material property, and has deeply permeated its character and attitude.

As a confirmation of what hereby asserted, it may be considered the fact that the first name of the company today under celebration was *Fonderia Metalli*, changed later in *Stabilimento Tecnico in Fiume* (currently *Stabilimento Tecnico Fiumano*), both italian names, and its statute was published in italian language (**figs.1a, 1b**). Furthermore, the letter sent to the Chamber of Commerce of Fiume on 24th January 1875 to inform about the acquisition of the *Stabilimento Tecnico* was handwritten, in good italian language of those days, personally by Robert Whitehead who, in specifying the new name of the Company as *Fabbrica Torpedini di Roberto Whitehead*, even italianized his name from Robert in Roberto (**fig. 2**). The document by which Robert Whitehead was given the Fiume honorary citizenship, (**fig. 3**) was written in aulic italian, and in current italian was published the circular letter informing about the transformation of the Company as from co-partnership



Fig.1a: Statute of 1870 of the Stabilimento Tecnico in Fiume (Stabilimento Tecnico Fiumano), in italian language (Historical Archive of Fiume).

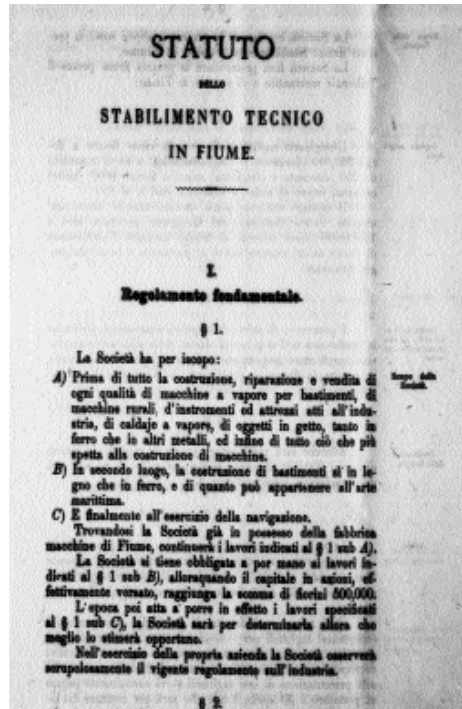


Fig. 1b: First page of the Statute of the Stabilimento Tecnico in Fiume, in italian language (Historical Archive of Fiume).

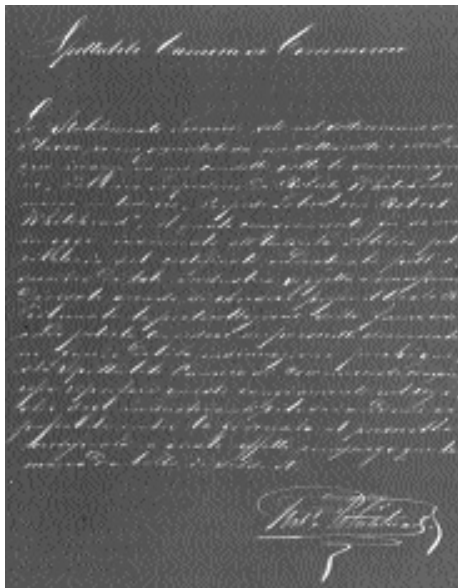


Fig. 2: Letter, in Italian, by which Robert Whitehead informs the Chamber of Commerce of Fiume about the acquisition of the Stabilimento Tecnico Fiumano and its conversion in Torpedo Factory of Roberto Whitehead (Historical Archive of Fiume). Note the Italianization of the name from Robert in Roberto. “Lo stabilimento tecnico sito nel sottocomune di Plasse venne acquistato da me sottoscritto e verrà da qui innanzi da me condotto sotto la denominazione “Fabbrica Torpedini di Roberto Whitehead” ovvero in tedesco “Torpedo Fabrik von Robert Whitehead”, il quale cambiamento fu da me in oggi insinuato all’Autorità politica per il rilascio del certificato industriale per l’esercizio di tale industria soggetta a concessione. Diviso avendo di chiedere presso il locale R. Tribunale la protocollazione della firma così onde poterla corredare dei prescritti

documenti ne faccio debita insinuazione perché questa Spettabile Camera di Commercio si compiacesse riportare questo cambiamento nel registro degli industriali rilasciandomi se possibile entro la giornata il prescritto certificato a quale effetto compiego qui la marca da bollo di soldi 50. Roberto Whitehead” (Historical Archive of Fiume).

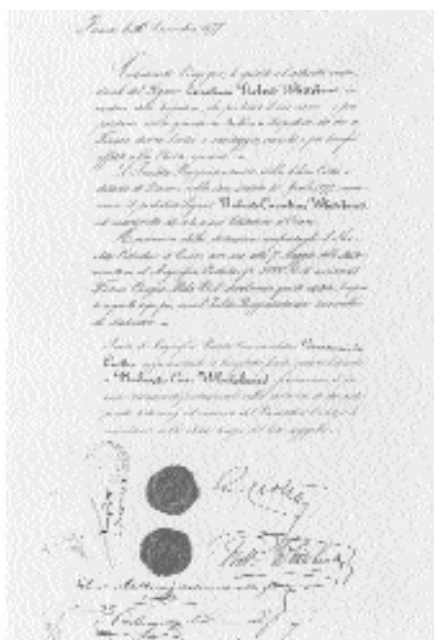


Fig.3: Document by which the Mayor of Fiume Giovanni De Ciotta confers the honorary citizenship to Roberto Cavaliere Whitehead (Historical Archive of Fiume). The document is in aulic Italian language.

company in joint stock company (**fig. 4**). As a matter of fact the italian language was quite popular in the area in that period and many official acts and document were edited in such idiom.

As to the internal working environment of the Company it must be indicated that many of the workers were of italian origin and/or italian speaking and that the italian language was very commonly used.

Looking at the very first drawings produced in the Company, when it was not yet adopted a specific criteria to comment and complete them, it can be seen that the majority of the few notes and specifications present in the documents were given in italian language (**tabs. 1, 2, 3, 4**); after some years, when the content of the notes started to be a bit more complete, it can be verified that in many cases, also in drawings prepared for nations different than Italy, including

Austria, the comments were expressed in italian (**tabs. 5, 6, 7, 8, 9**). This is applicable also for drawings produced when the management of the plant was under the responsibility of the Vickers-Armstrong group (1906-1924).

After 1911, when in each drawing it was impressed a stamp suitable to identify its main elements, the terminology of the stamp was always expressed in italian language, even for drawings produced when the Company was transferred to Saint Polten (1915-1918) and independently from the customer for which the drawing was prepared. (**tabs. 10, 11, 12, 13, 14**).

1) – STATUS OF THE COMPANY AT THE END OF THE 1ST WORLD WAR.

Even if the city of Fiume had not directly suffered the tragedies of the trench war, its political and economical situation, at the end of the 1st world war, far from being satisfactory, was almost close to the collapse and bankruptcy. The occupation of the town by the troupes of Gabriele D'Annunzio during the period september 1919 – December 1920 (**fig. 5**), which was terminated by the military intervention of the italian governmental troupes, known as the 1920 "bloody Christmas", was cause of frictions and contrasts among the parties, and certainly not an event foreboding peace and progress in the area. Also the period of autonomy and independence following the treaty of Rapallo (**fig. 6**) between the Reign of Italy and the Reign of Serbs, Croats and Slovenians of 12 November 1920, was characterised by instability and disorders, with political fights among the parties of Grossich, Zanella and Depoli, with serious disadvantage for the economy of the town and for the welfare of the people.

Stability, even if not immediate prosperity, was achieved after the treaty of Rome of 27 January 1924 between the Italian and the Yugoslavian Governments, treaty which assigned the City of Fiume to the Reign of Italy and ruled the political status of the town up to the end of the 2nd world war.

But which was the status of the Whitehead Torpedo Factory within this political contour? And which was the situation of the Company after the enormous



Fig. 4: Circular letter by which the Whitehead & Co. informs about the transformation of the Company as from copartnership company in joint stock company (Historical Archive of Fiume). The document is in italian language.

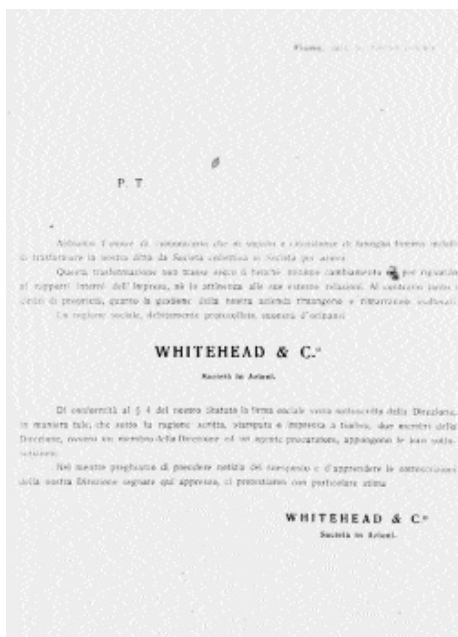


Fig. 5: The military occupation of the city of Fiume by the “legionari” of Gabriele D’Annunzio. Fiume, September 1919 (Historical Archive of Società di Studi Fiumani Roma).

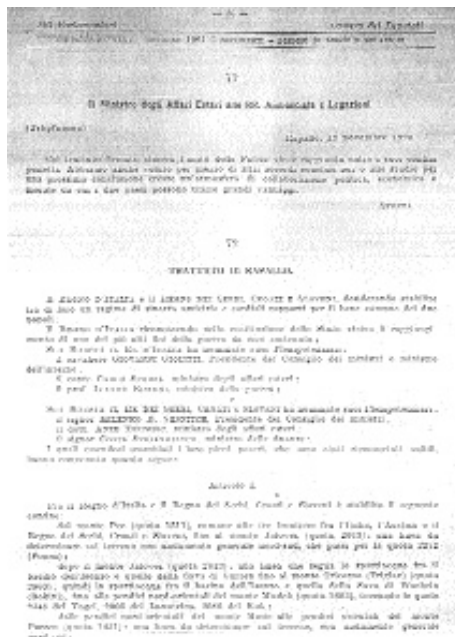
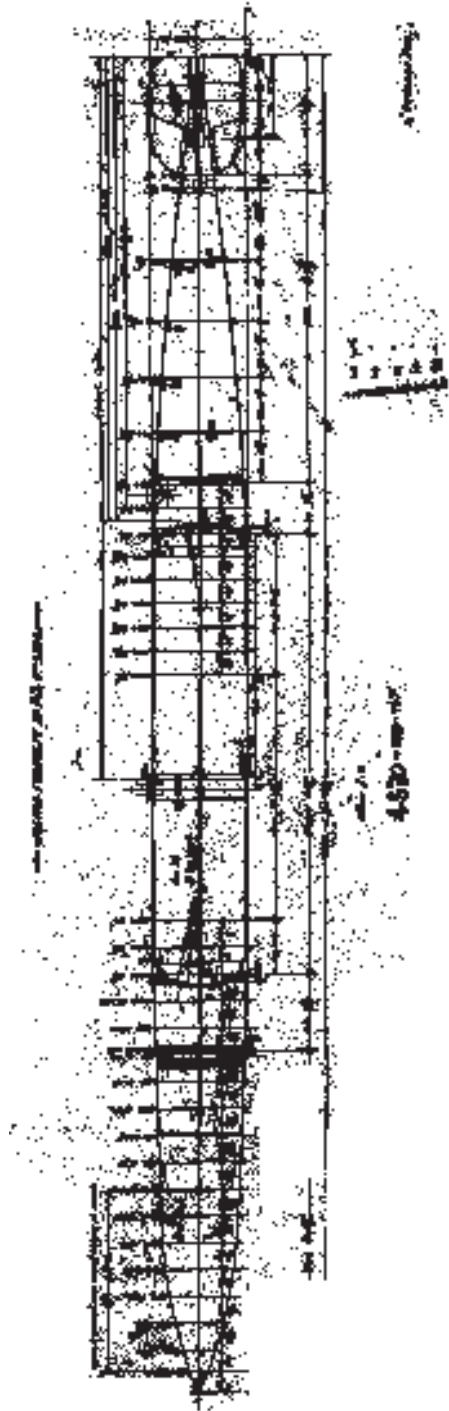
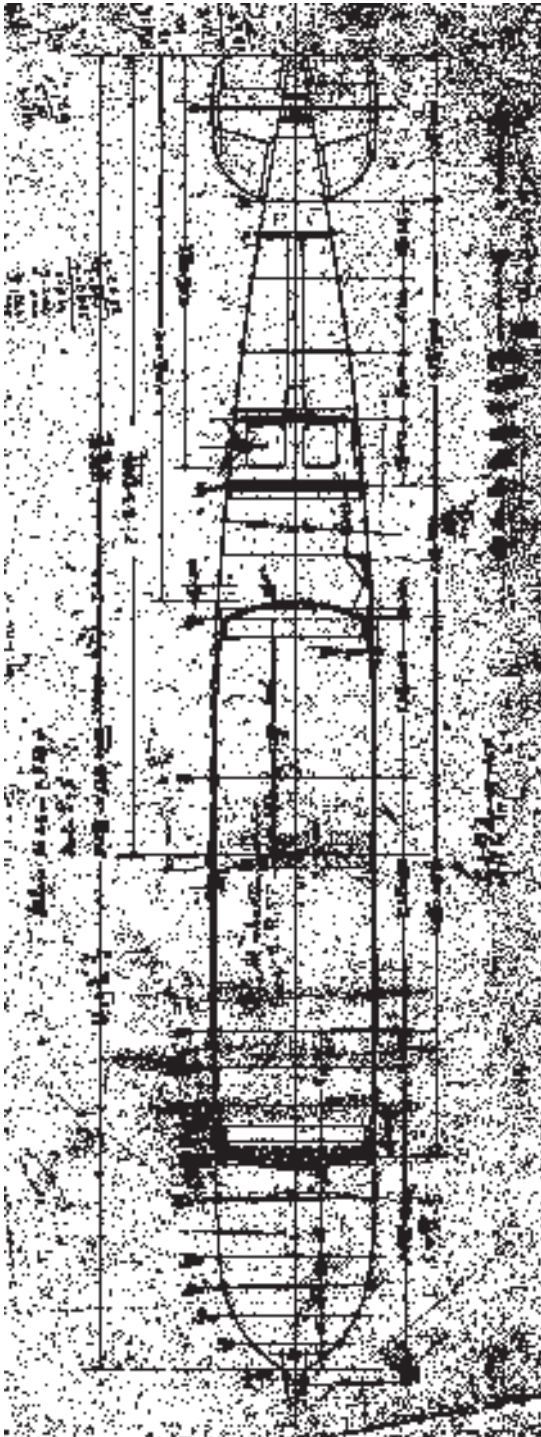


Fig. 6: Treaty of Rapallo of 12th November 1920, between the Reign of Italy and the Reign of Serbs, Croats and Slovenians (Historical Archive of the Ministero Affari Esteri Roma).

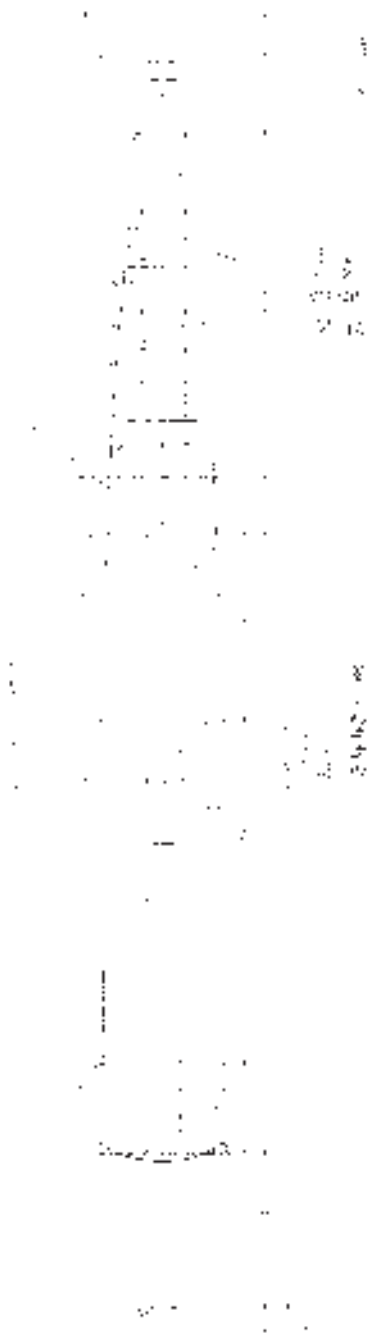


Tab. 1: Torpedo type W64 x 356/4,985, supplied to France in 235 units. Period of delivery 1892 - 1895. 3 cylinders motor. Speed: 27 knots for a distance of 200 m., 26,8 knots for a distance of 400 m. Letter F stands for France. Date, name of client, n° of units and comments in italian language (WASS Historical Archive)

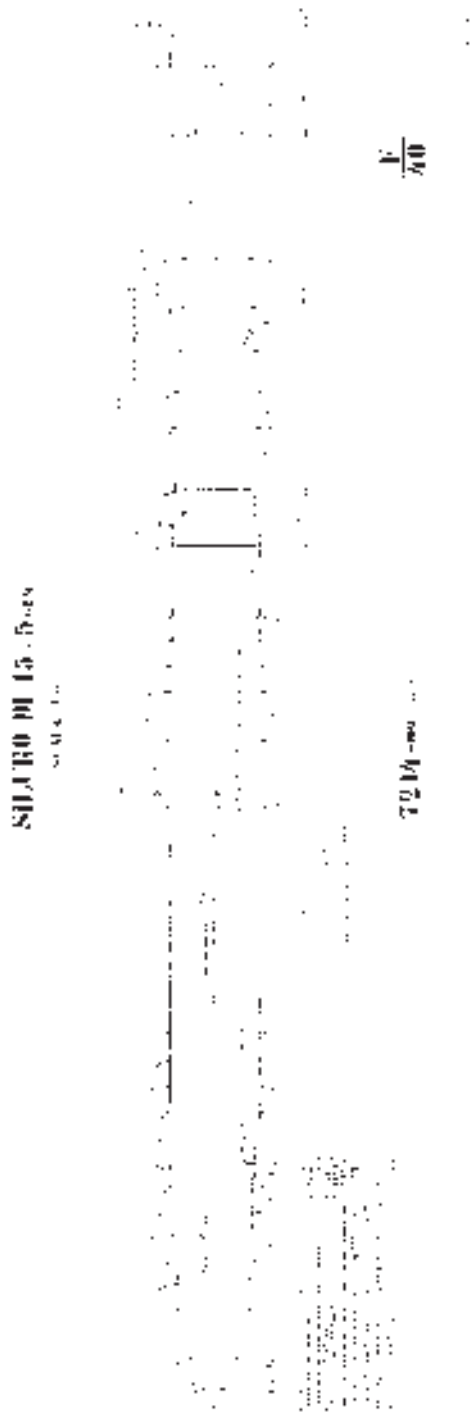


Tab. 2: Torpedo type W55 x 450/3,68, supplied to Argentina in 23 units, to Brazil in 47 units, to Norway in 34 units, to Japan in 12 units. Period of delivery 1893 - 1897. 3 cylinders motor. Speed: 29 knots for a distance of 400 m. Letters "Ar" stands for Argentina, letters "Br" stands for Brazil, letter "N" stands for Norway, letter "J" stands for Japan. Date and comments in Italian language (WASS Historical Archive)

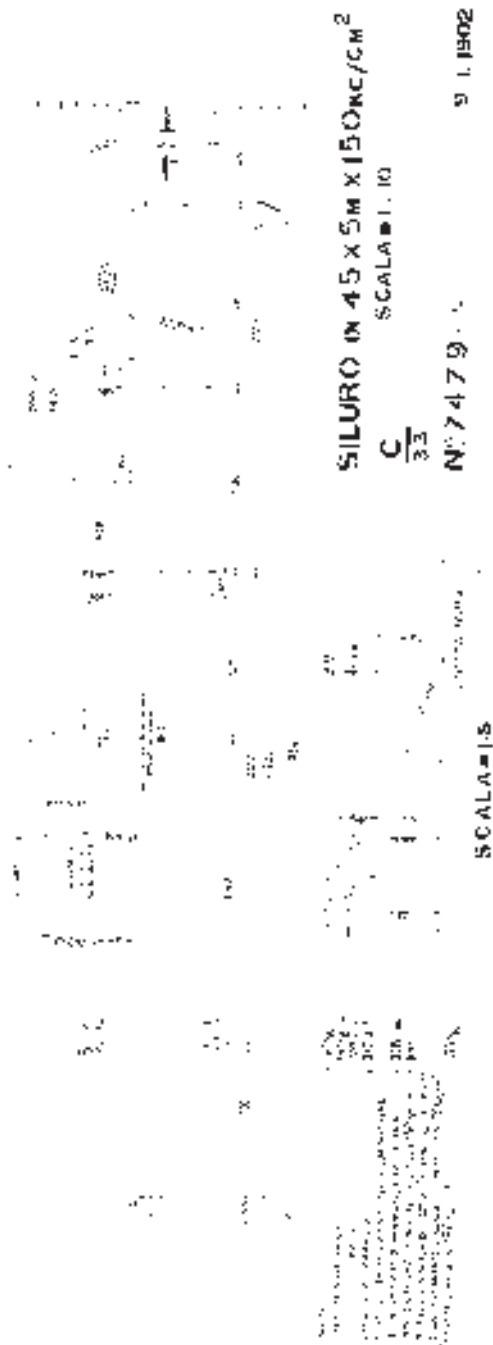
Tab. 3: Torpedo type W100 x 450/5, supplied to Japan in 84 units. Period of delivery 1896 - 1899. 3 cylinders motor. Speed: 29,1 knots for a distance of 400 m., 28,9 knots for a distance of 600 m., 27,8 knots for a distance of 800 m. Letter "J" stands for Japan. Date and comments in italian language (WASS Historical Archive).



Tab. 4: Torpedo type W60 x 450/5, supplied to Austria in 15 units and to Argentina in 50 units. Period of delivery 1895 - 1897. Last deliveries equipped with gyro control. 3 cylinders motor. Speed: 29,4 knots for a distance of 400 m., 29,2 knots for a distance of 800 m. Letter "A" stands for Austria, letters "Ar" stands for Argentina. Date, n° of units and comments in italian language (WASS Historical Archive).



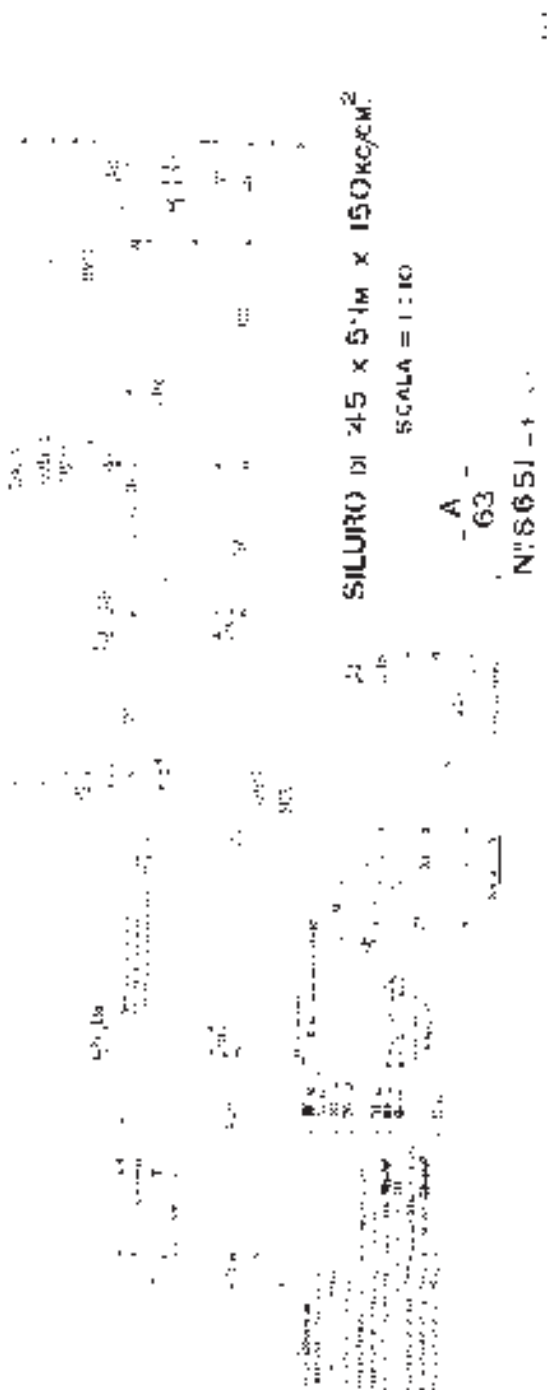
Tab. 5: Torpedo type W60 x 380/5,68, supplied to France in only 1 prototype. Period of delivery 1901. Equipped with gyro control. 3 cylinders motor. Speed: 31,7 knots for a distance of 400 m., 30,3 knots for a distance of 600 m. Letter "F" stands for France. All detailed comments are in italian language (WASS Historical Archive).



Tab. 6: Torpedo type W60 x 450/5, supplied to Chile in 10 units. Period of delivery 1902. Launchable by cage. Equipped with gyro control. 3 cylinders motor. Speed: 31,3 knots for a distance of 400 m., 25,9 knots for a distance of 1.000 m., 25,2 knots over a distance of 2.000 m. Letter "C" stands for Chile. All detailed comments are in italian language (WASS Historical Archive).



Tab. 7: Torpedo type W60 x 450/5. Supplied to Holland in 26 units. Period of delivery 1902 - 1904. Equipped with gyro control (as all other torpedoes indicated hereafter). 3 cylinders motor. Speed: 30,4 knots for distance of 400 m., 28,5 knots for distance of 800 m., 27,7 knots for distance of 1.000 m. Letter "O" stands for Olanda (Holland). All detailed comments are in italian language (WASS Historical Archive).



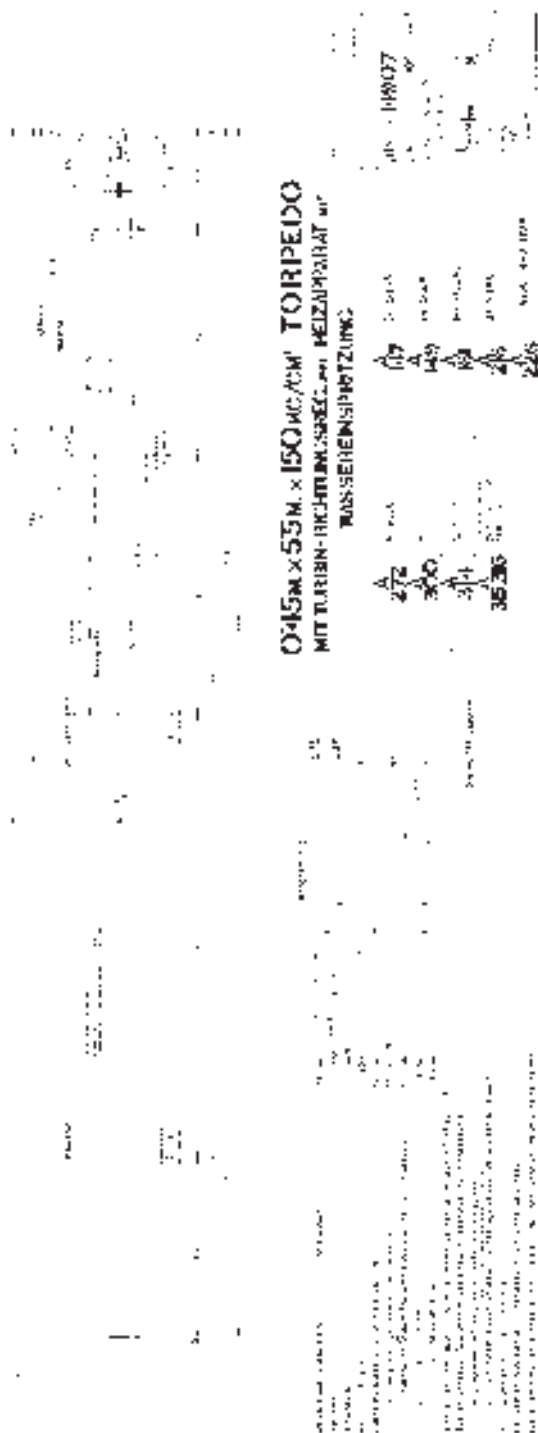
Tab. 8: Torpedo type W100 x 450/5. Supplied to Austria in 90 units. Period of delivery 1905. 4 cylinders motor. Letter "A" stands for Austria. All detailed comments are in italian language (WASS Historical Archive).



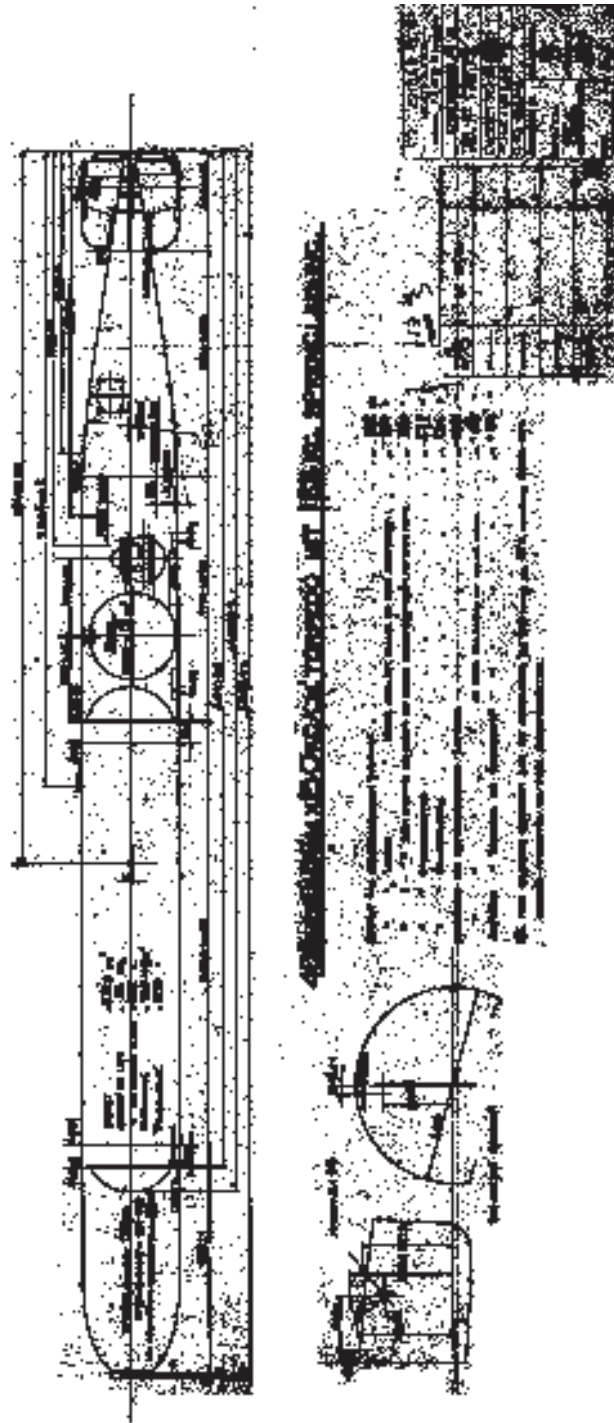
Tab. 9: Torpedo type W95 x 450/5,2. Supplied to Russia in 40 units. Period of delivery 1910. 4 cylinders motor and heater. Letter "R" stands for Russia. All detailed comments are in italian language (WASS Historical Archive).



Tab.11: Torpedo type W100 x 450/5,3. Supplied to Rumania in 44 units. Period of delivery 1914. 4 cylinders motor. Letters "RU" stands for Rumania. All detailed comments are in french language while the stamp is in italian (WASS Historical Archive).



Tab.12: Torpedo type W110 x 450/5,5. Supplied to Austria in 341 units. Period of delivery 1912 - 1914. 4 cylinders motor. Letter "A" stands for Austria. All detailed comments are in german language while the stamp is in italian (WASS Historical Archive).



Tab.13: Torpedo type W182 x 450/5,568. Supplied to Austria in 32 units. 4 cylinders motor. War head equipped with exploder with net-cutter mechanism. Letter "A" stands for Austria. All detailed comments of the drawing, which refers to the Saint Polten period, are in german language, while the stamp is in italian (WASS Historical Archive).



Tab.14: Torpedo type W245 x 533,4/7,580. Company test torpedo. 2 cylinders motor (horizontally placed). All detailed comments of the drawing, which refers to the Saint Polten period, are in german language, while the stamp is in italian (WASS Historical Archive).

productive effort of the war period and after the military defeat of the country for which the productive effort had been performed?

Let us examine how the position of the Whitehead Torpedo Factory appeared shortly before the start of the war.

The majority of the share capital (51 %) was in the hands of the british group Vickers – Armstrong Whitworth, which, after the death of Robert Whitehead (14 November 1905), following the suggestion and the pressure of the British Government, had taken over, in 1906, the majority of the property as well as the full control of the management of the Company. The group was also in control of the house branch of Weymouth (opened in 1891 by Robert Whitehead) and of the affiliated companies “Société des Torpille Whitehead”, opened in 1913 in Saint Tropez (France), (**fig. 7**) and “Societá Anonima Italiana Whitehead” (SAIW), opened in 1914 in Naples (Italy).

At the start of the war (July 1914) the Fiume factory was requisitioned and militarised by the Austro-Hungarian Authorities, depriving Vickers-Armstrong of power. Furthermore all contracts which the Company had stipulated with foreign countries were suspended and the torpedoes ready to be delivered or under construction, were diverted for the use of the Austro-Hungarian or German Armed Forces. The same behaviour was applied also to the italian supplies, notwithstanding Italy was formally still part of the “Triple Alliance” together with Austria and Germany (Italy will enter the war one year later, in may 1915).

As a consequence of this line of conduct from the austrian side, the French Government started to use the torpedo factory of Saint Tropez for its own needs and the Italian Government made the same with the Naples plant.

When the war was over, the Vickers-Armstrong group, pushed and stimulated by the british authorities, initially tried to keep the property of the Torpedo Factory of Fiume, and to buy, in addition, the “Danubius” shipyard of the “Ganz” company of Budapest, shipyard which was physically located next door to the Whitehead plant. But the D’Annunzio raid and the consequent period of violence and disorders, convinced the group to change their mind and to give up any sort of initiative in the area.

The three industrial units (main plant of Fiume and the two affiliated companies of Saint Tropez and Naples), which started to represent a tough problem for the group, were set into liquidation: the french site was gradually transferred to french capitals which, in 1925, had the complete control of the plant which was given the name of “Société des Torpilles Saint Tropez”; the Naples plant was taken over, at the end of 1921, by an italian group headed by the “Banca Commerciale Italiana” and was given the name of “Silurificio Italiano”; the situation of the Fiume plant was a bit more complicated and needs to be better explained in its details.

In 1920, Mr. Giuseppe Orlando (**fig. 8**), at that time chairman of the “Acciaierie Terni” (steel producer) of Terni (Italy) and of the “Cantieri Navali Luigi



Fig. 7: Societé des Torpille Whitehead, opened in Saint Tropez in 1913 by the Torpedo Factory of Fiume, when the management was in the hands of the Vickers Armstrong Whitworth group (Private collection of Mr. Michel Le Dard, of DCNI of Saint Tropez).



Fig. 8: Giuseppe Orlando, first President of the refunded Whitehead Torpedo Factory (“italian period”). The first title of the factory was Stabilimenti Whitehead - Società di Esercizio Anonima. Since 10th May 1928 the title will be Silurificio Whitehead di Fiume (Private collection of Mrs. Luciana Orlando Bonetti).



Fig. 9: Giuseppe Toeplitz, Managing Director of the Banca Commerciale Italiana who had the merit of the acquisition of the Societa Anonima Italiana Whitehead (SAIW) of Naples at the end of the 1st world war and who hardly tried to compete with Giuseppe Orlando for the control of the Whitehead plant of Fiume (Historical Archive of Banca Commerciale Italiana).

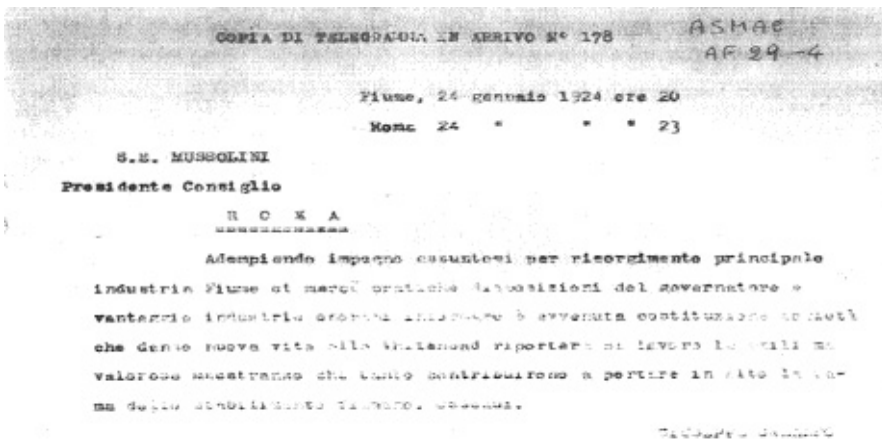


Fig. 10: Telegram sent by Giuseppe Orlando to the Prime Minister Benito Mussolini, informing about the reactivation of the Whitehead Torpedo Factory (Historical Archive of the Ministero Affari Esteri Roma).

Orlando” of Livorno (Italy), had finalized the acquisition of the Danubius shipyard of Fiume which were renamed “Cantieri Navali del Quarnaro”. The transaction was strongly supported by the Italian Government, who was trying to overrule the similar action which the British Government had tried to impose to the Vickers-Armstrong group. After having got the Danubius shipyard, Orlando was negotiating with Vickers the possible acquisition of the torpedo factory, being supported, in the operation, by the military Governor of the city of Fiume, General Gaetano Giardino. The proposal was brought to the attention of the very recently nominated head of the Italian Government Benito Mussolini, who agreed with the proposal.

But the Managing Director of the Banca Commerciale Italiana, Giuseppe Toeplitz (**fig. 9**), who was the main personality involved in the acquisition of the SAIW of Naples and in its transformation in Silurificio Italiano, was also strongly interested in getting the property of the former Whitehead Torpedo Factory of Fiume, having, to this respect, the support of the Minister of the Navy Adm. Thaon di Revel. Both parties had good arguments in their favour: the Banca Commerciale was sustaining the convenience to unify the two torpedo factories of Fiume and Naples to create only one powerful torpedo industry, suitable to cover all the Italian Navy needs, operation which could possibly require the transfer of the Fiume plant to Naples; the Orlando group, fully supported by Gen. Giardino, was stressing the convenience for the economical recovery and industrial revitalisation of the city of Fiume, to maintain the plant where it was, improving and completing its organisation and structure. The thesis of Orlando prevailed in the end, fact which caused the presence in Italy of two independent and competing torpedo factories.

Due to the bankruptcy position of the Whitehead Torpedo Factory, it was not possible for Mr. Orlando to finalise immediately the acquisition of the Company; it was however reached an agreement with the liquidator which allowed the Orlando group to reactivate and operate the factory on the basis of a lease contract up to the moment of the definition of the bankruptcy procedure. It was therefore set up a new company, by the name of **Stabilimenti Whitehead - Società di Esercizio Anonima**” which took over the operation and the management of the plant, giving new life to the old factory founded by Robert Whitehead 49 years before. It was the 24th January 1924.

The promoting partners were: the Banca Nazionale di Credito, the Cantieri Navali del Quarnaro, Mr. Giuseppe Orlando and Mr. Arturo Ciano. Giuseppe Orlando was elected President. The event was celebrated on the same day inside the plant, and at 8 p.m. Mr. Orlando sent a telegram to the Prime Minister Benito Mussolini saying: “Fulfilling engagement taken for revival main industry of Fiume and thanks to directions of Governor taken in favour of industries, have honour to inform of occurred constitution of Society which, giving new life to Whitehead, will bring back to activity the humble but valiant workers who much contributed to raise the fame of the Fiume factory. Regards. Giuseppe Orlando” (**fig. 10**).

The following day, at 1.35 p.m., it was the turn of General Giardino, Governor of Fiume, to send the following cable to Mussolini: "Yesterday evening was signed the constitution act of the Società di Esercizio Stabilimenti Whitehead and this morning, with excellent result, was performed a sea trial of a new torpedo. Generale Giardino" (**fig. 11**).

This new torpedo of 450 mm. of diameter, was the result of studies performed by the Whitehead Company during the last period of war, when the plant was transferred to Saint Polten. The drawings of this torpedo were supposed to form part of the documentation included in the sale transaction, but they were never found.

Three days after the constitution of the new company, on 27th January 1924, with the "Treaty of Rome" between Italy and Yugoslavia, the city of Fiume was definitely assigned to Italy.

2) – THE NEW START.

The efforts of the new management were concentrated mainly on two lines of action:

the immediate revival of the design activity, facilitated by the presence of the former technical Director, Eng. Karl Hassenteufel (**fig. 12**);

the approach to old and new customers, starting from the Italian Navy, which the events of the war had taken closer to the Silurificio Italiano of Naples.

As to the design and technical activity, in addition to the resumption of the design of the above mentioned new 450 mm. torpedo (of which were produced two samples), the Company realised, utilising internal funds, also two 533,4 mm. prototype torpedoes, intensively tested at sea. The Italian Navy showed interest in the product and the Director General of Artillery and Ammunition, General Gambardella, paid a first visit to the Company during July 1924, to attend some sea trials (**fig. 13**). However the first contract, stipulated with the Italian Navy on October 1924, was for only fifty 450 mm. torpedoes to be used on board MAS (light torpedo boats). The fact was that, as a consequence of the Washington conference of 1921-22, all nations were subject to significant reductions of their naval forces, so that the necessity of naval weapons was not a priority matter. Only in 1925, the Italian Government approved a new quinquennial naval plan which took, between 1928 and 1933, to the construction of several important units, both surface ships and submarines, for which a massive plan of torpedoes production was thereafter requested.

As to new foreign customer, the company started immediate negotiations with Spain and the Reign of Serbs, Croats and Slovenians (hereinafter indicated as Yugoslavia). As a matter of fact, negotiations with the two nations were already started years back directly by the liquidators of the Company (as it may be



Fig. 11: Telegram sent by the Governor of Fiume, General Giardino to the Prime Minister to inform about the constitution of the Società di Esercizio Stabilimenti Whitehead and of the execution of a torpedo sea trial (Historical Archive of the Ministero Affari Esteri Roma).



Fig. 12: Eng. Karl Hassenteufel, technical Director of the Whitehead Torpedo Factory during the “italian period”. He had covered the same position during the administration of the Company by the british group Vickers Armstrong Whitworth (WASS Historical Archive).

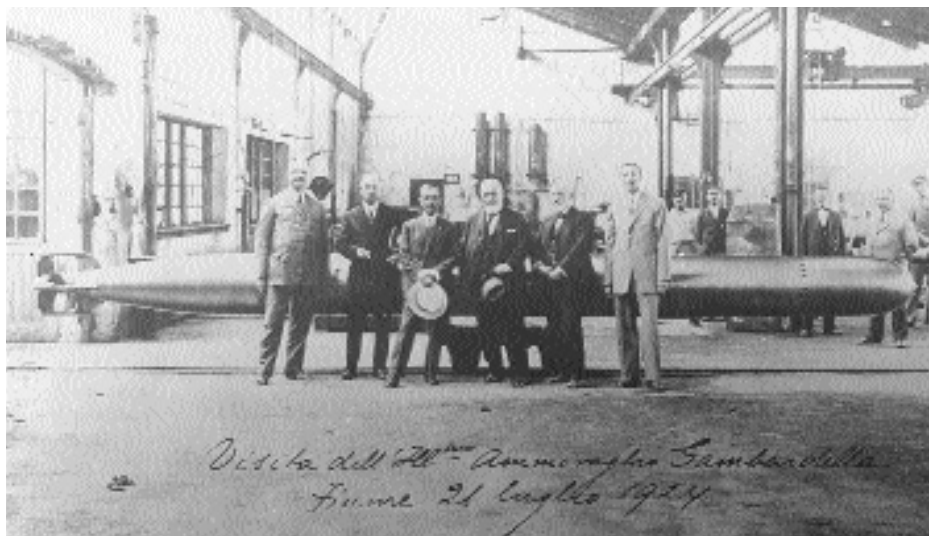


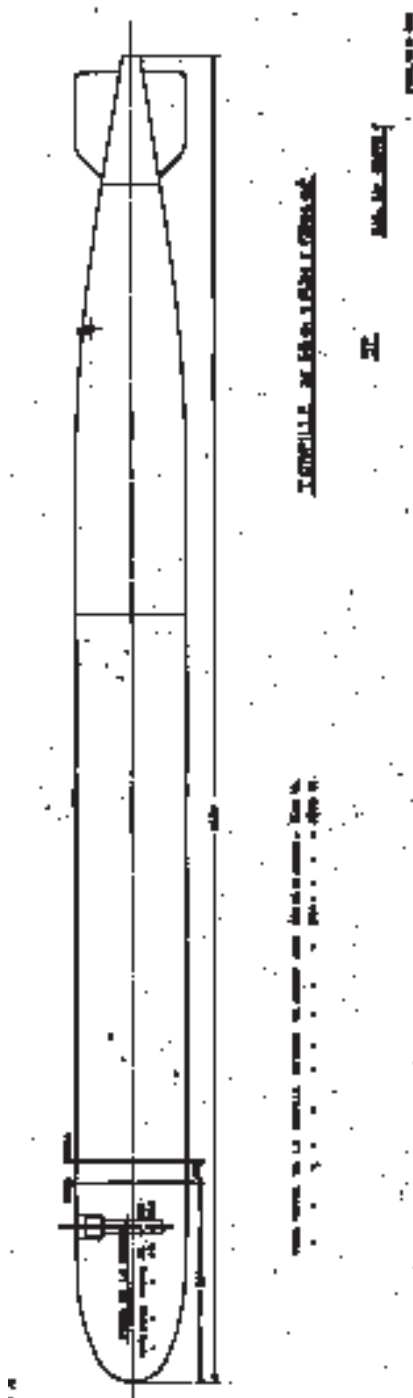
Fig. 13: Gen. Gambardella, of the Italian Navy (with the white hat), visits the torpedo factory (21 July 1924). With him Giuseppe Orlando (at his left) and Eng. Hassenteufel (extreme left) (WASS Historical Archive).

deducted by the drawing of **tab. 15**, dated 24/12/1921 clearly referring to Spain – letters SP), who, however could not finalise the transaction. The new management took over the responsibility of both negotiations and, as a first result, on 30th June 1924, it took place the signature of a contract for the supply of 25 torpedoes and 10 launching tubes to Yugoslavia (**fig. 14**), which then, happened to be the first foreign customer of the Stabilimenti Whitehead Societf di Esercizio, being at the same time, the 29th nation to have purchased torpedoes from the company originally founded by Robert Whitehead. The torpedoes sold were not of new type, but pertained to a previous sale to the Russian Navy finalised in 1912-13, referring to 248 torpedoes of 450 mm. of diameter, 5,5 m. of length, warhead with 100 Kg. of trotyl explosive and exploder with net-cutter, two horizontal cylinders propulsion motor, air heater with water injection, speed of 43 knots over a distance of 2.000 m. and 31 knots for a distance of 6.000 m. (**tab. 16**). Even if not brand new, the torpedoes were of very good characteristics. The sale to the Russian Navy, started in 1912, was not completed because, as mentioned before, with the start of the war all supplies to foreign nations were suspended; at the suspension time a quantity of approximately 40 torpedoes were still to be delivered to Russia.

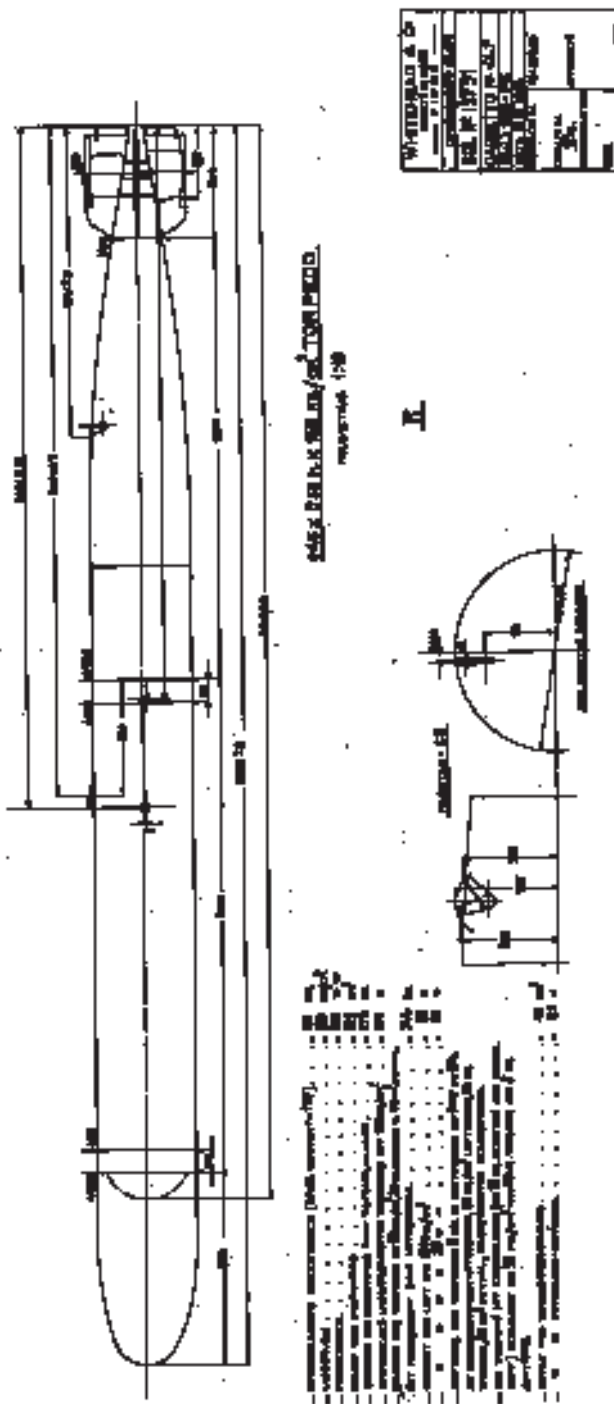
The negotiation with Spain, started by the liquidator in 1921 (**tab. 15**), took a much longer time but the contract, finalised on 27th July 1925, was referring to the production of 150 newly designed 533,4 mm torpedoes, and was therefore, of basic importance for the Company. The same Prime Minister Mussolini, who was at the same time also Minister of Foreign Affairs, took personal interest in the matter, sending a telegram to the Italian Ambassador in Madrid (**fig. 15**) asking for his support. Spain, which had never before acquired Whitehead torpedo, resulted therefore the 30th nation in the Whitehead customers list. The contract included the supply of 100 torpedo 7,5 m. long, with a war head with 250 Kg. of explosive charge, speed of 42 knots over a distance of 4.000 m. and 24 knots over a distance of 15.000 m.. The other 50 torpedoes were 6,5 m. long, had a war head with 240 kg. of charge and developed a speed of 40 knots over a distance of 4.000 m. and 27 knots over a distance of 10.000 m. (**tab. 17**).

Many foreign delegations, coming from Japan, U.S.A., Great Britain, Holland, France, Argentina, Siam, asked to visit the factory, thus confirming that the name of Whitehead was still much known all over.

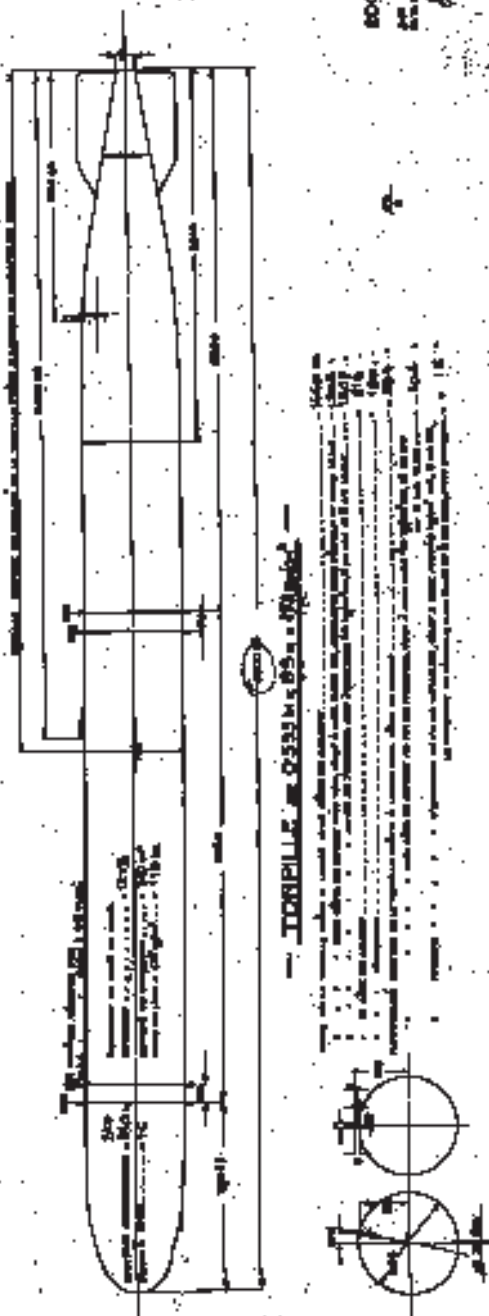
The untimely death of President Giuseppe Orlando (27th January 1926) represented a bad blow for the Company; he had really played a leading role in the reconstruction of the firm, taking advantage of his strong personality and his possibility of contact at the highest levels, and there could have been the danger of a loss of confidence in the diversified world of the customers. Luckily his oldest son Luigi (**fig. 16**), who was member of the Board of Directors and who was appointed President, showed good management attitude, succeeding in minimising the consequences of the sad event.



Tab. 15: This drawing, not executed with the rules normally adopted by an organised technical office, confirms the information available in other documents, that the curator of the bankruptcy started negotiations with Spain in 1921. The letters "SP" indicated near the number of the drawing, confirm that the drawing was prepared for Spain (WASS Historical Archive).



Tab.16: Torpedo type W100 x 450/5,550 (Originally produced for Russia during the period 1913 -1914). 2 cylinders motor (horizontally placed) with air heater and water injection. Speed: 43 knots for a distance of 2.000 m. , 31 knots for a distance of 6.000 m. Sale to Russia not completed for starting of 1st world war. Design and availing material utilised for sale to Yugoslavia in 1924 when Whitehead Torpedo Factory was reopened under the management of Giuseppe Orlando (WASS Historical Archive).



Tab.17: Torpedo type W240 x 533,4/6,5. Supplied to Spain in 50 units. Period of delivery 1926 - 1929. 2 cylinders motor (horizontally placed). Speed: 40 knots for a distance of 4.000 m., 27 knots for a distance of 10.000 m. (WASS Historical Archive).

Contratto S. H. S.

Il R. Ministero Marina da il
 30 giugno 1918 si è recato a Belgrado
 per concludere e firmare un contratto in
 la Marina dello Stato S. H. S. per la forn-
 itura di 25 siluri da 450 mm e 10 tubi
 di lancio, presentemente, come è stato
 al Consiglio, trattato dall'Amministrazione
 della Marina Commerciale.

Fig. 14: Abstract of "Verbali delle sedute del Consiglio di Amministrazione" of the Stabilimenti Whitehead Societa di Esercizio, indicating the signature of a contract with the Navy of the Reign of Serbs, Croats, Slovenians for the supply of 25 450mm torpedoes and 10 launching tubes (WASS Historical Archive).

TELEGRAMMA

IN DIRIGENZA

DEPARTAMENTO

Madrid

Il sottoscritto

come consigliere capo preside della fabbrica italiana
 di torpedi Whitehead, con la quale ho una commissione
 di fiducia a Madrid, e prima di tutto desidero
 sapere se per la causa a Madrid sono stati
 informati a che punto sono le questioni e se si agisce
 in senso favorevole alla fabbrica italiana.
 Per favore mi farete sapere per il canale di
 Madrid, se si è già parlato della fabbrica italiana
 con la Marina.

Mussolini

Fig. 15: Telegram sent, on 8th July 1923, by the Prime Minister and Minister of Foreign Affairs Benito Mussolini to the Italian Ambassador in Madrid, asking for a sustaining action towards the Spanish Government in favour of the Fiume factory (Historical Archive of Ministero Affari Esteri Roma).



Fig. 16: Eng. Luigi Orlando, senior son of Giuseppe, and 2nd President of the refunded Whitehead Torpedo Factory (Private collection of Mrs Luciana Orlando Bonetti).

On 19th December 1927 the long procedure of the bankruptcy settlement came to an end and the Stabilimenti Whitehead – Società di Esercizio succeeded in winning the auction for the sale of the property of the old Whitehead Company for the sum of 5.915.000 Italian liras, thus getting the ownership of the buildings and of the equipment of the Company. Subsequently, on the Company meeting of 10th May 1928 it was taken the decision to change the name of the Company from *Stabilimenti Whitehead – Società di Esercizio* in *Silurificio Whitehead di Fiume*. On the same occasion, it was taken the decision to speed up the construction of the new launching station (**figs. 17, 18**) which, entitled to Giuseppe Orlando, was then officially inaugurated, at the presence of all the town authorities and of several high level Italian Navy representatives, on 1st December 1928.

3) – THE NEW SUCCESS.

The good quality of the products and the positive commercial relationship associated to the reputation and fame of the Whitehead's name, took the Company to a new period of success and expansion. The three drawings of **figs. 19, 20, 21**, show the configuration of the plant respectively in 1871 (when still Stabilimento Tecnico Fiumano), in 1895 (under Robert Whitehead management), and in 1925, (two years after the assumption of the management by Giuseppe Orlando).

In 1927 the Turkish Navy, one of the very first customer of the original Whitehead Torpedo Factory (first purchase in 1877) came back to the Company to acquire seventeen 450 mm. torpedoes (**tab. 18**); the Dutch Navy, which between 1878 and 1914 had acquired 564 torpedoes of various types, in the years 1927-1930 ordered to the new Whitehead twenty 450 mm. torpedoes followed by sixty weapons of 533,4 mm. of diameter (**tab. 19**); in 1928 the Argentinean Navy, another old and constant customer, stipulated a contract for the acquisition of one hundred 533,4 mm. torpedoes, which were doubled in 1936 (**tab. 20**); still in 1928 Spain increased by twelve units the 533,4 mm, 7,5 m long torpedo (**tab. 21**); in 1929 it was the Finnish Navy to become the 31st customer of the Company, even if the quantity of torpedoes purchased was limited to four 533,4 mm. samples.

In 1929 the Company took part, with its new name, to the “Fiera Campionaria di Fiume”, a general products town exhibition, where were shown the new torpedoes developed in the first years of its new identity (**figs. 22, 23**). At that time the employees in the factory summed up to almost 800, of which 100 white collars and 700 workers.

In 1932 the U.R.S.S., the new giant empire born as a consequence of the Russian revolution, approached the Silurificio Whitehead di Fiume to stipulate a very important contract for the purchase of seventyfive 533,4 mm. and forty 450 mm. torpedoes, so becoming the 32nd customer of the Whitehead Company (**tab. 22**).

With the approval of the previously mentioned quinquennial naval plan, the Italian Navy ordered large quantities of torpedoes of new types which were



Fig. 17: The launching station of the Whitehead Torpedo Factory how it appeared at the end of the XIX century (WASS Historical Archive).



Fig. 18: The torpedo launching station entitled to Giuseppe Orlando (to the left). To the right the old (modernised) Robert Whitehead station (WASS Historical Archive).

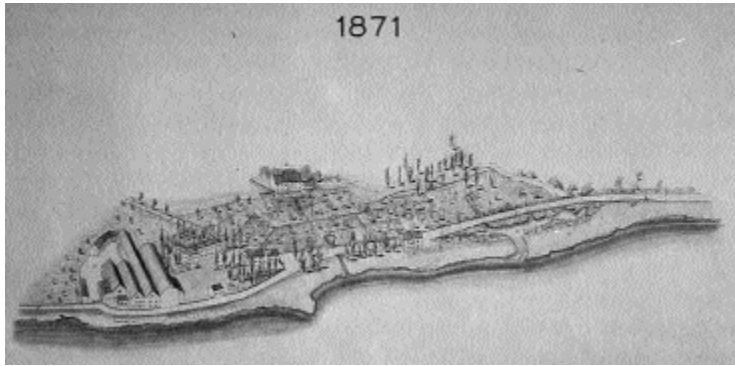


Fig. 19: Map of the Stabilimento Tecnico Fiumano in 1871. It is visible the “casa rossa” in the centre of the photo (WASS Historical Archive).

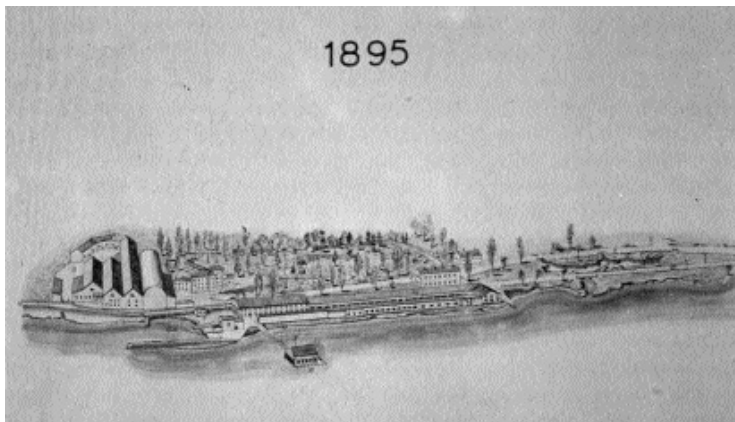


Fig. 20: Map of the Fabbrica Torpedini di Roberto Whitehead in 1895. The “casa rossa” significantly enlarged, is surrounded by the buildings of the plant (WASS Historical Archive).

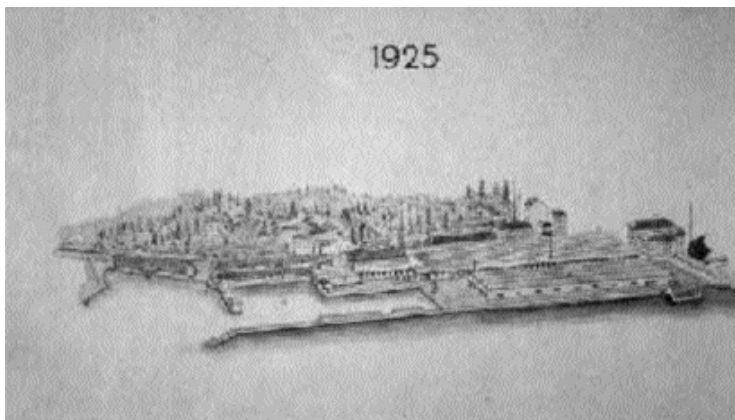


Fig.21: Map of the Stabilimenti Whitehead - Societa di Esercizio in 1925. Note the much enlarged Port (WASS Historical Archive).

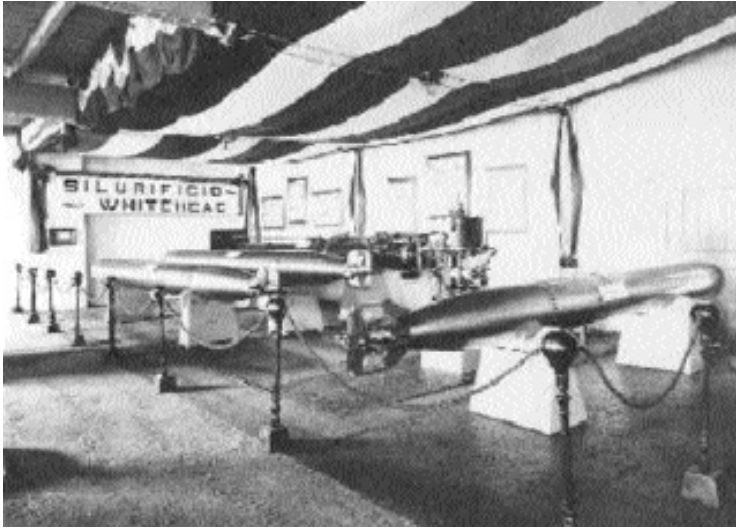


Fig. 22: The stand of the Silurificio Whitehead di Fiume at the "Fiera Campionaria di Fiume" of 1929 (WASS Historical Archive).

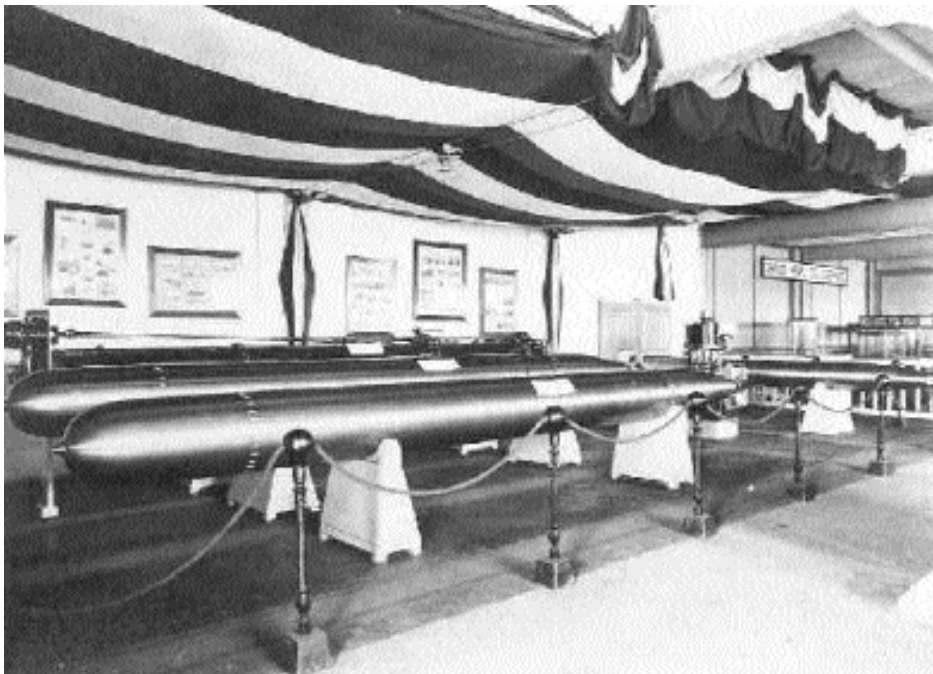
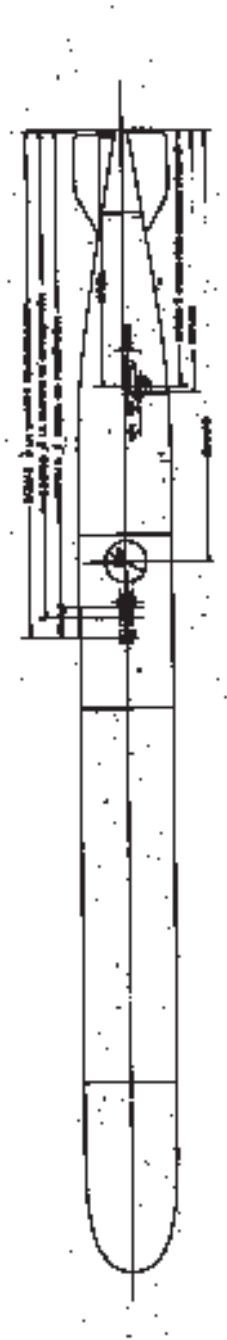
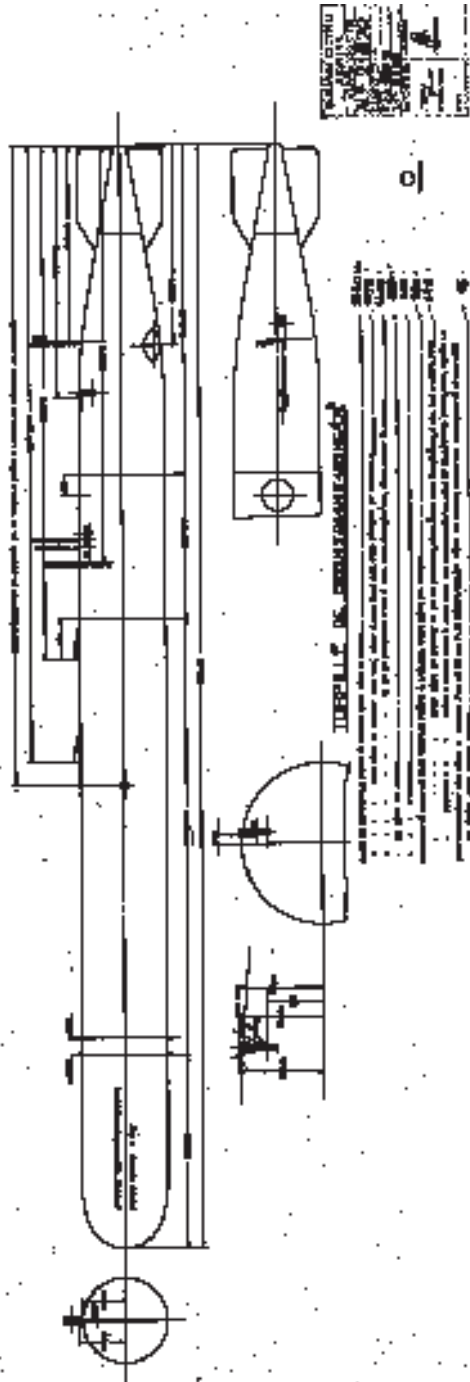


Fig. 23: The Stand of the Silurificio Whitehead di Fiume at the Fiera Campionaria di Fiume of 1929 (WASS Historical Archive).



Tab. 18: Torpedo type W170 x 450/5,53. Supplied to Turkey in 17 units. Period of delivery 1927. 2 cylinders motor (horizontally placed). Speed: 44 knots for a distance of 2.000 m., 29 knots for a distance of 6.000 m. (WASS Historical Archive).



Tab.19: Torpedo type W300 x 533,4/6,840. Supplied to Holland in 60 units. Period of delivery 1930 - 1934. 2 cylinders motor (horizontally placed). Speed: 41 knots for a distance of 4.000 m., 28 knots for a distance of 10.000 m. Letter "O" stands for Olanda (Holland) (WASS Historical Archive).

submitted to an intensive cycle of operational evaluation with hundreds of sea trials performed with submarines and ships of the fleet. Of significant importance were series of launches performed with ships running at the maximum speed of more than 30 knots (**fig. 24**).

A new type of “siluro veloce” (high speed torpedo), suitable to reach a speed of more than 50 knots, was in the meanwhile developed and launched at sea for the first time on 22nd August 1932 (**fig. 25**). The excellent results of the trials induced the Italian Navy to congratulate the Company on the brilliant achievement with the letter in **fig. 26**. The same sign of appreciation was shown by the U.S. Naval Attaché who had attended the trials (**fig. 27**).

In 1933 the Company started to work in the field of air dropped torpedoes, maintaining to this respect, contacts both with the Italian Navy and the Italian Air Force. Three samples of torpedoes, specifically developed for the use on aircraft's, were manufactured at company's expenses. Furthermore, due to the fact that the availability of aeroplanes for the execution of experiments could not be guaranteed with continuity, it was decided to finance also the fabrication and installation of a special catapult, suitable to simulate the same forces, accelerations and decelerations actually present in real launches from aeroplanes (**figs. 28, 29**) The impressive structure was installed near the Giuseppe Orlando launching station, thus forming, together with the old Robert Whitehead launching facility, a group of constructions (**fig. 30**) which has characterised the coast profile of Fiume for many years, and part of which even if with some modifications, is still today part of the landscape.

4) – THE FOUNDATION IN LIVORNO OF “MOTO FIDES”.

In 1934 the Board of Directors of the Silurificio Whitehead di Fiume, after having negotiated a licence agreement with the german producers of the “Zundapp” motorcycles, decided to open in Livorno (Tuscany) a factory for the production of such vehicle. The intention was to manufacture that motorbike, which in Germany had gained an excellent reputation, mainly for the needs of the Italian Army (**fig. 31**). A new company, named “Moto Fides” (“Fides” is the latin for “Faith” and is part of the motto of the City of Livorno), was therefore officially formed, in the hope to initiate another successful type of industrial activity (**fig. 32**). The expectations were however far too optimistic, and not even a single motorcycle was manufactured. It was consequently necessary to find for the company a different type of activity and, after few useless attempts in the field of general mechanics, it was decided to use the plant, first, as a manufacturer of torpedo components, and, after having obtained by the Navy the due clearance, as a manufacturer of complete torpedoes. Between 1937 and 1939 the plant was transformed according to the new necessities under the guidance of its young managing director, Eng. Paolo Orlando (**fig. 33**), the younger son of Giuseppe Orlando, the founder of the new Whitehead. In 1939, much before the formal opening ceremony, the firm received an order of 100 torpedoes of 533,4 mm of diameter.

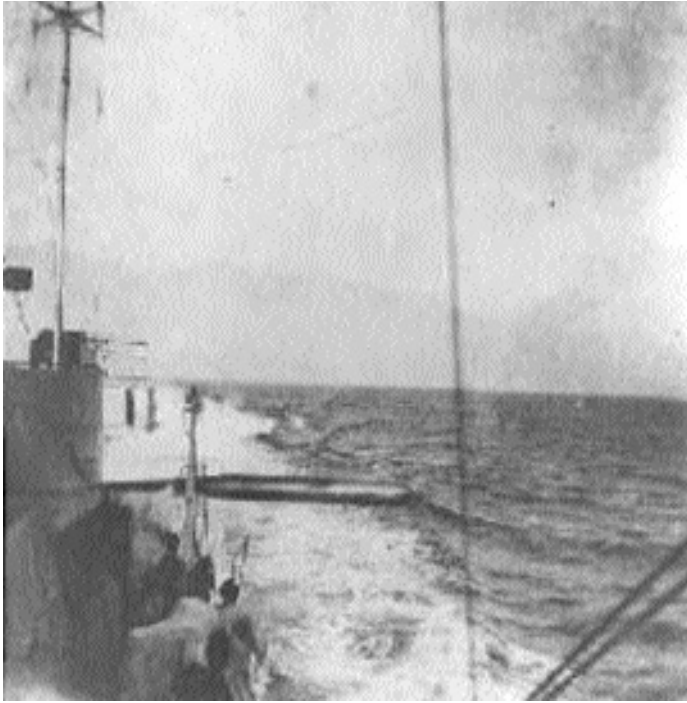


Fig. 24: Launch of a 533,4 Whitehead torpedo from R.C.T Nicotera, running at a speed of more than 30 knots (WASS Historical Archive).

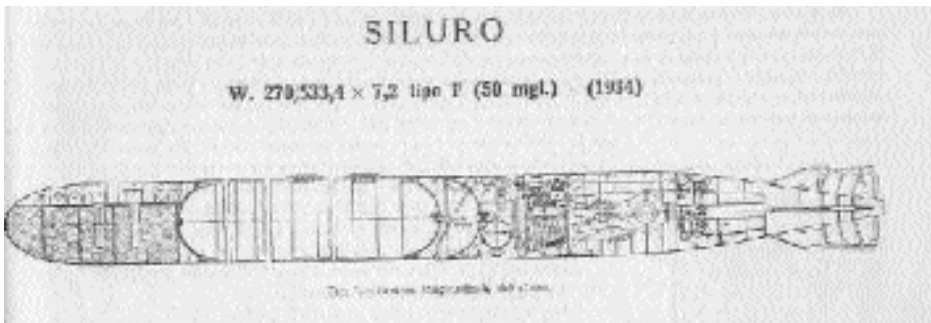


Fig. 25: Cut view of a 533,4 "high speed" Whitehead torpedo (more than 50 knots) (WASS Historical Archive).

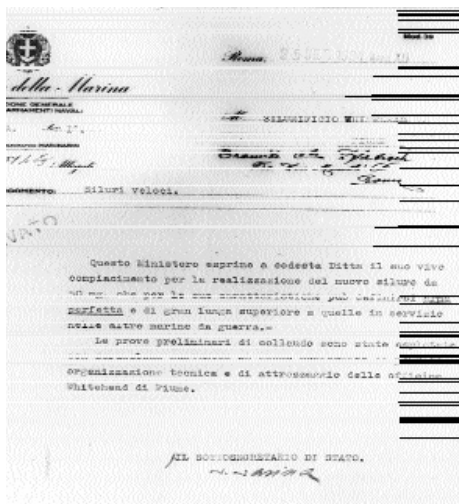


Fig. 26: Letter of congratulation of the Italian Navy (25th September 1934) for the results achieved with the high speed Whitehead torpedo (WASS Historical Archive).

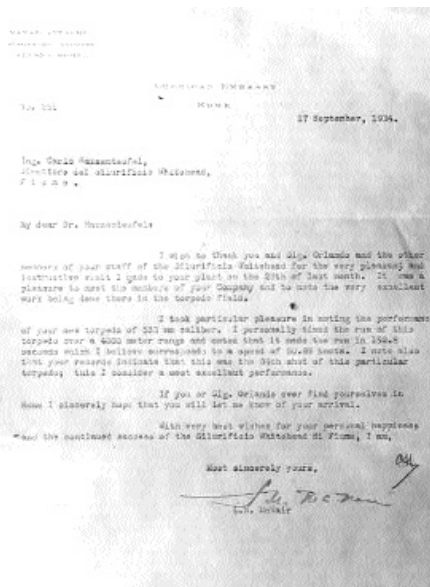


Fig. 27: Letter of congratulation of the U.S. Naval Attache (17th September 1934) for the results achieved with the high speed Whitehead torpedo (WASS Historical Archive).



Fig. 28: Catapult suitable to simulate stresses present in a torpedo launched from aeroplanes. To the right the Giuseppe Orlando launching station (1933-1934) (WASS Historical Archive).

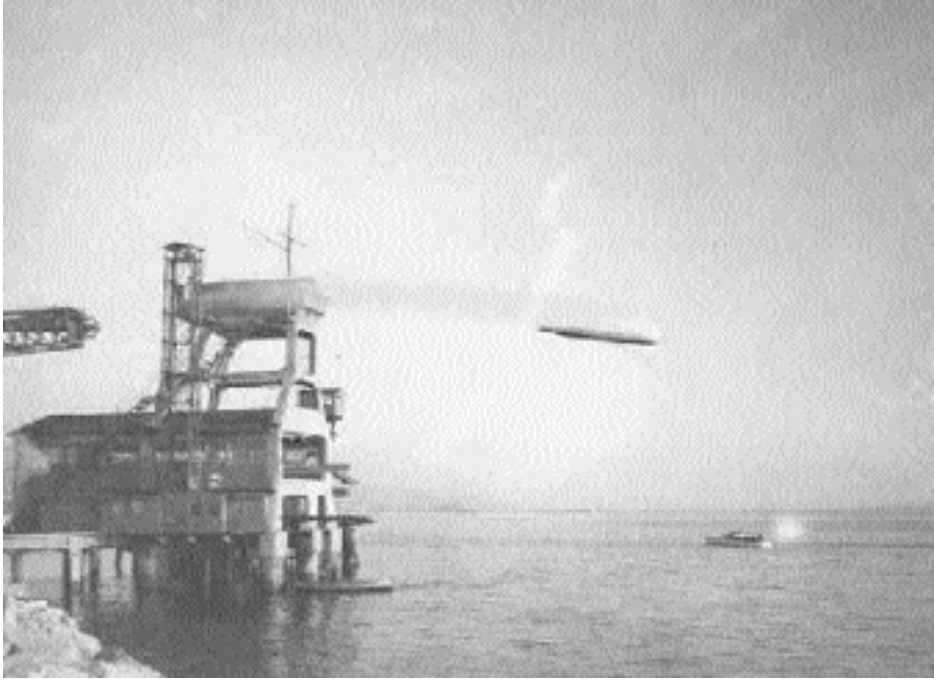


Fig. 29: Torpedo ejected from the catapult to simulate the impact with the sea surface during an air drop (1935) (WASS Historical Archive).



Fig. 30: Panoramic view of the three torpedo launching structures (1935-1936) (WASS Historical Archive).

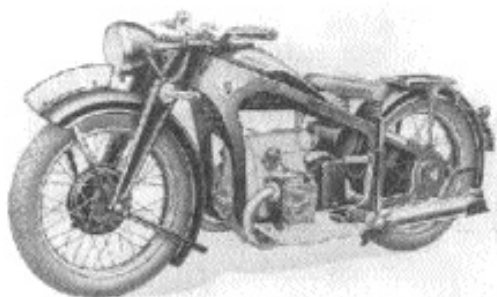


Fig. 31: Photo of the Zundapp motorcycle object of licence agreement between the german company and Moto Fides (1934-1935). The licence agreement never entered into force and the only activity performed by Moto Fides on the matter, was the assembling of 8 prototypes whose components were provided by Zundapp (WASS Historical Archive).



Fig. 32: The Moto Fides plant in Livorno (1937-1938). Failing the production of motorcycle, the plant produced initially hand grenades. Later started to produce torpedo components for the Fiume workshop and finally was cleared to manufacture the complete torpedo (WASS Historical Archive).



Fig. 33: Paolo Orlando, the junior son of Giuseppe, who was for many years General Manager and Managing Director of Moto Fides and also of the Fiume plant (1938-1939) (Private collection of Mrs. Luciana Orlando Bonetti).

5) – TOWARDS THE 2ND WORLD WAR.

The production activity started to be intensified in 1938. The previous years had seen the escalation of technical and operational evaluation trials. Hundreds of operational sea launches were performed from submarines and surface vessels and lot of experiments were conducted with the use of several types of aeroplanes (**figs. 34, 35**). The german armed forces (both Navy and Air Force) were particularly interested in the results of the tests on the airborne torpedo, and after having witnessed a cycle of trials specifically organised for their benefit, on 1st April 1939 placed an order for 300 torpedoes type W 170 x 450 x 5,46 (**fig. 36**), even before the Italian Navy and Air Force placed corresponding orders for their own use.

Requests of torpedoes were coming also from many other nations: Rumania, Greece, Siam, URSS, Peru, China, Poland, Holland, Yugoslavia, Portugal, Finland, Japan asked the Silurificio Whitehead di Fiume to present proposal of supplies, but the worsening world political situation rendered the transactions difficult if not impossible and only the negotiations with Finland, Holland, Rumania and Japan were finalised.

All three italian torpedo factories, Silurificio Whitehead di Fiume, Silurificio Italiano of Naples and Moto Fides of Livorno worked at fast rate to satisfy the overwhelming requests of the italian and german armed forces, even if the difficulties in the supply of raw materials and primary products compelled the plants to heavily turn to autarchy (**fig. 37**).

6) – THE TRAGEDY OF THE 2ND WORLD WAR.

When Germany started the occupation of Poland (1st September 1939), causing the reaction of France and Great Britain which led to the declaration of war on 3rd September, Italy declared its not belligerence and U.S.A., Japan and China their neutrality. There were signs, however, that sooner or later also Italy would have been one of the party; the instruction to camouflage the plant, to provide it with antiaircraft's weapons, to build anti air-raid shelter and to buy gas masks were indirectly disclosing the will and the decision to be active participants in the conflict.

6.1) – The Livorno plant.

Moto Fides, in its new structure of torpedo factory, was officially inaugurated on 10th March 1940, when it was already in full production, and few weeks later (10th June) Italy entered the war. On 30th October 1940, when the magnitude of the tragedy was not yet perceived in all its gravity, Vittorio Emanuele III, King of Italy, paid a visit to the factory (**figs. 38, 39**). On 12th November 1941 the name of the plant was changed from Moto Fides to **Silurificio Moto Fides S.A.**

To deserve the name of "silurificio" (torpedo factory), something was missing to Moto Fides: a torpedo launching station, where to test torpedoes at sea. Initially, all the produced weapons were sent to the Fiume plant where were tested in the local facilities; however due both to the long distance to be covered and to the overwork of the Fiume station, it was decided to build a specific launching station in the proximity of the plant. After a very long, time-consuming research, a proper location was found in Porto Santo Stefano, a village on the Tuscany coast, approximately 100 km south of Livorno; the impressive construction (**fig. 40**) revealed however to be useless, because it entered in full activity on 29th June 1943, exactly one day after the bombardment of the Livorno plant which caused the complete stop of the torpedoes production. The people employed in the base who had not the chance to start their activity were 84 white collars and 156 workers.

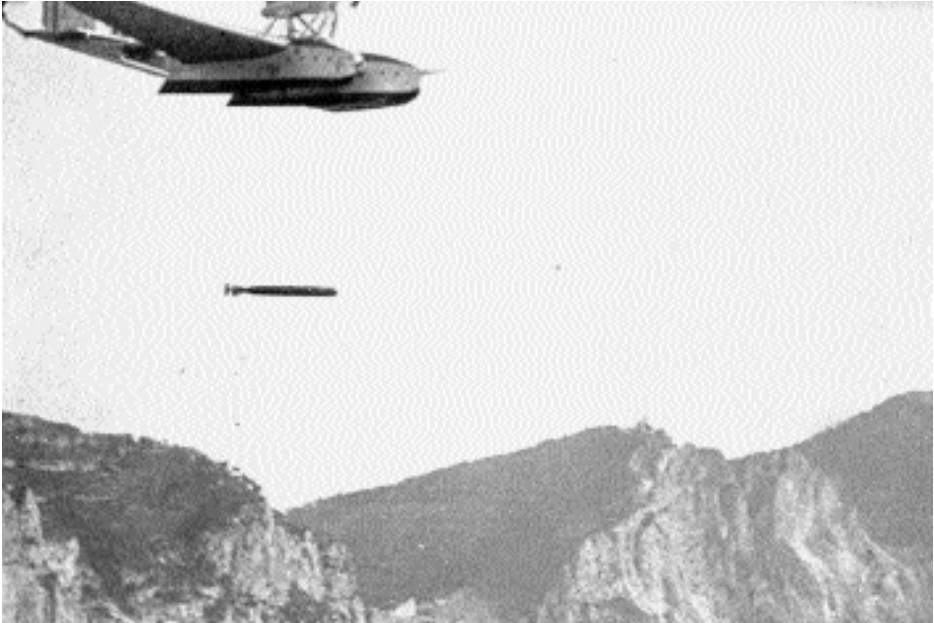


Fig. 34: Air drop from a SIAI Marchetti S55 (1935) (WASS Historical Archive).



Fig. 35: Air drop from a SM81 aeroplane (1935) (WASS Historical Archive).

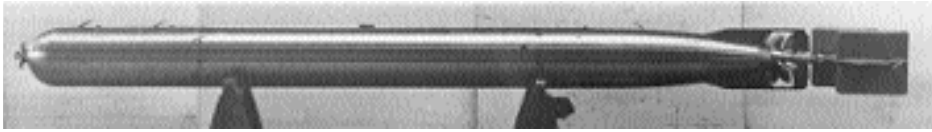


Fig. 36: The famous W 170 x 450/5,46 Whitehead airborne torpedo, complete with air stabiliser (1939) (WASS Historical Archive).

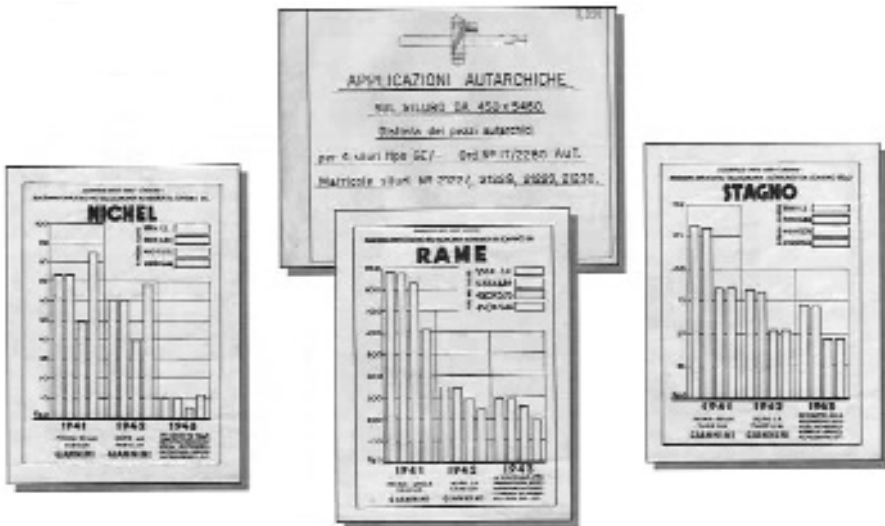


Fig. 37: Due to sanctions and to the lack of primary products, the italian torpedo producers (Whitehead, Moto Fides and Silurificio Italiano) were compelled to make use of autarchy materials (1938-1943) (WASS Historical Archive).



Fig. 38: The local press emphasises the visit of H. M. King Vittorio Emanuele III to Moto Fides. When the visit occurred (30th October 1940), Italy had entered the war as of 5 months (WASS Historical Archive).

Up to that moment, the Silurificio Moto Fides had fully performed its mission. After the first 100 533,4 mm. torpedo, the Italian Navy ordered, in 1940, other 21 torpedoes of the same type plus 60 weapons of 533,4 mm of diameter and 6,84 m. of length; in 1941 other 404 units type 450 x 5,75, plus 110 units type 533,4 x 6,84. In 1942 there were other orders for 133 torpedoes type 533,4 x 6,84 plus 306 torpedoes type 450 x 5,75; during the same year the Rumanian Navy placed an order of 14 + 20 torpedoes type 533,4 x 7,20. In March 1943 another order of 373 torpedoes type 450 x 5,46 for aeroplanes was placed by the Italian Armed Forces.

At the beginning of 1943 the total force of personnel in Silurificio Moto Fides was of 274 white collars and 2.300 workers, all fully employed. But the beginning of 1943 was also the start of a tremendous period for the factory. The Allied Forces had started to bomb italian towns quite intensively and therefore the management had adopted a decentralisation plan which foresaw the transfer of the technical offices and also of some of the production departments in surrounding areas. The plan was under way when a first bombing took place on 28 May; the damage was not much and the plant could proceed with the production. But the following bombardment of 28 June was very severe (**fig. 41**), producing fear and panic in the workers who practically, since then, deserted the plant causing the cease of all activities, rendering also useless the Porto Santo Stefano launching station. Also the station was however object of bombing and, after the 8th of September 1943, date of the italian armistice, suffered other damages caused by the mining of the structure by the german troops (**fig. 42**).

On 8th September the Silurificio of Livorno was occupied by the German Army and all the machinery was requisitioned and transferred to Germany. The buildings, additionally damaged by another severe bombardment on 24th September, was completely abandoned by personnel with the only exception of some guards; these were later deported to Germany and the plant remained for a long period of time in the hands of vandals.

When the allied troops arrived in Livorno, the factory was requisitioned and part of it utilised as car workshop for the occupation army. The plant was given back to the Company only on 15th October 1945.

6.2) – The Fiume plant.

The “Silurificio Whitehead di Fiume” which was much bigger and which had a much larger production capability than Moto Fides, was assigned several important contracts for hundreds and hundreds of torpedoes of types 450 x 5,75, 533,4 x 6,84 and 450 x 5,46 both by the Italian Navy and Air Force. Of particular importance was a contract with the Italian Navy for 950 torpedoes type 450 x 5,46 which the Navy transferred then to Germany for use on aeroplanes.

In the first days of April 1941, Italy and Germany started the invasion of Yugoslavia. Considering the proximity to the border of the city of Fiume and the potential danger to the factory which could have arisen in case of possible military

actions in the area, it was ordered the displacement of all the existing ready torpedoes, main components, special materials, etc. to safer places like Trieste, Venice and Livorno. The complete work, which implied the movements of more than 2.500 tons of materials and the transfer of 1.300 workers, was completed in 7 days. The operation revealed to have been however unnecessary, and after few weeks everything was taken back to the original position.

Due to the amount of torpedoes to be produced, it was estimated indispensable to enlarge the factory which, in 1942 assumed the configuration of **fig. 43** with almost 4.000 employees.

On 1st August 1941 the Company received an order for 2.000 torpedoes (840 of which to be produced by Moto Fides) to be delivered to Germany; Germany was supposed to provide the factory with a complete set of machine tools and all raw materials. Part of the machinery was in fact supplied, but subsequently logistical difficulties caused the practical cancellation of the program.

Between 1942 and 1943 there was a specific request from the Luftwaffe to develop a very short torpedo (3,38 m) (**tab. 23, fig. 44**) to be used on fighter planes; it was also developed a radio-wireguided torpedo (Crocchi system) which was operationally employed during the last part of the conflict.

On August 1943, when the "Silurificio Moto Fides" had already ceased every activity, considering the negative development of the military operations, the management of the Fiume factory started to study a decentralisation plan, taking into consideration a series of places, even if, contrary to what had happened in Livorno, Fiume had not yet been object of allied air raids.

On the italian armistice day (8th September 1943) the german troops took control of the plant, which became thereafter an instrument in the hands of the germans. As to the resort for the decentralisation, it was chosen a small village in the province of Udine named "Fiume Veneto", where it was located the "Cotonificio Veneziano", a textile not active industry, with a plant suitable to receive the machines and instrument of the torpedo factory of "Fiume Carnaro"; in Fiume Carnaro were supposed to remain only the activities relating to the torpedo sea trials.

On 7th and 21st January 1944, during the transfer operations to Fiume Veneto, two air raids, with heavy bombardments, caused severe damages to the Fiume Carnaro plant (**figs. 45, 46**). The working conditions were severely deteriorating, both for the damages caused by the bombardments and for the constant presence and control of the german military personnel. In Fiume Veneto, in coincidence with the presence in the country of the partisan activity, started to be actuated even a moderate form of industrial sabotage. With the advance and the progress of the allied forces in central and northern Italy the german troops started to abandon the two factories, taking with them much of the tooling machines present both in Fiume Carnaro and Fiume Veneto.



Fig. 39: Paolo Orlando shows a torpedo war head to H.M. the King. Vittorio Emanuele III will visit again Moto Fides on 11 June 1941 together with the King of Bulgaria, allied of Germany and Italy (WASS Historical Archive). The title of the plant is still Moto Fides. The new title of Silurificio Moto Fides will be adopted only on 12th November 1941.

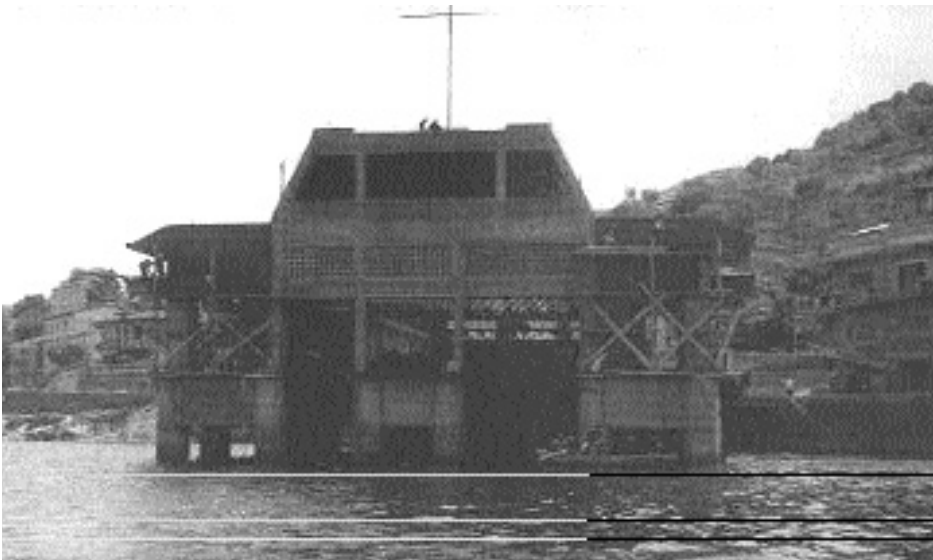


Fig. 40: Torpedo launching station ad Porto Santo Stefano (Tuscany coast around 100 Km south of Livorno) (1942-1943) (WASS Historical Archive).

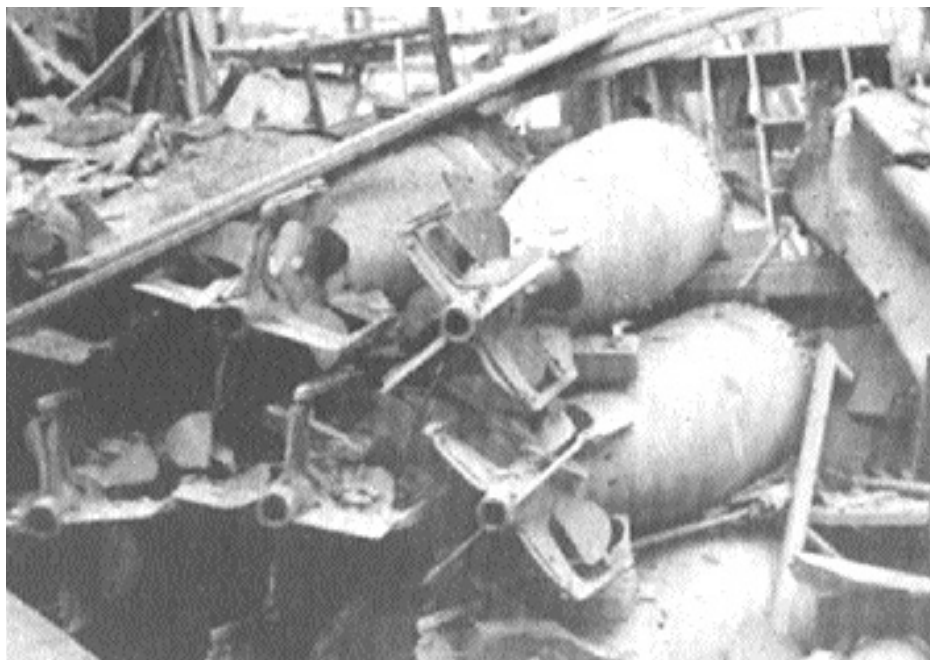


Fig. 41: Silurificio Moto Fides. Effects of the 28th June 1943 bombardment (WASS Historical Archive).



Fig. 42: Porto Santo Stefano. Effects of allied bombing and german mining on the torpedo launching station (1943-1945) (WASS Historical Archive).

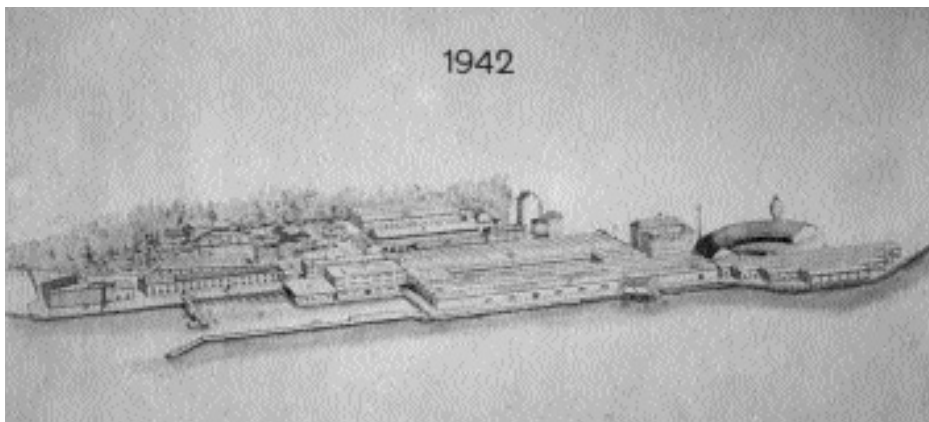


Fig. 43: Map of the Silurificio Whitehead di Fiume in 1942 (WASS Historical Archive).

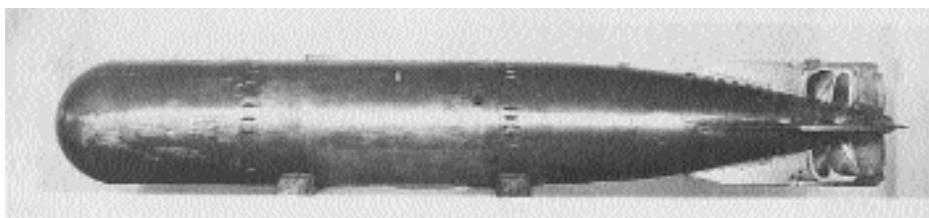


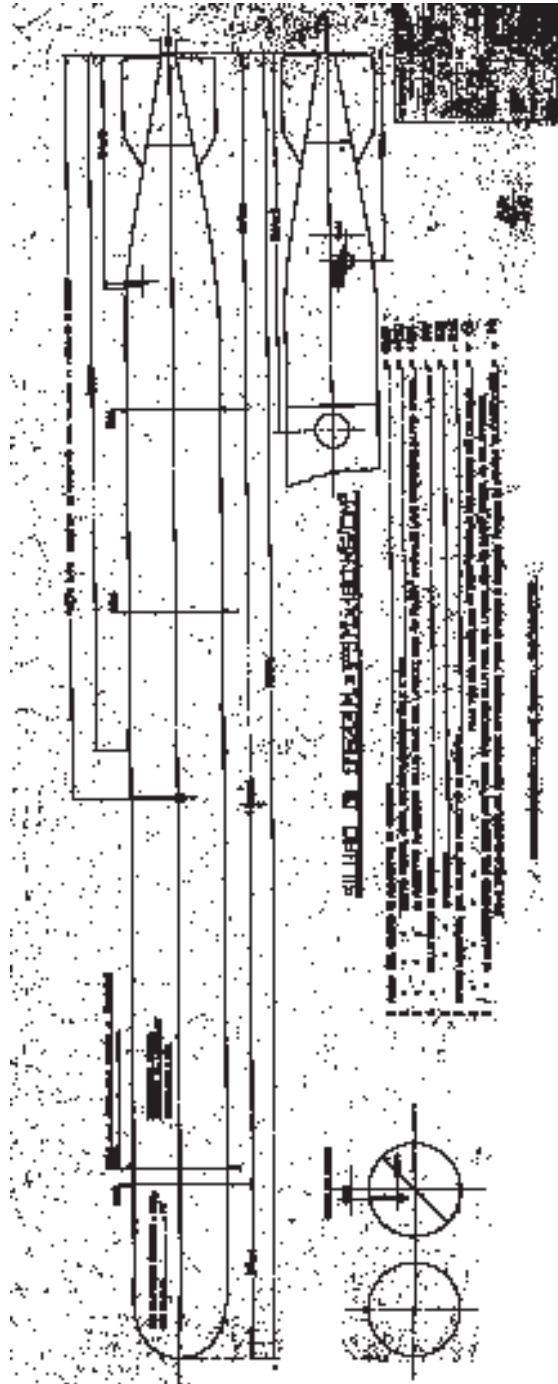
Fig. 44: Picture of the 3,38 m. short torpedo (“silurotto”) (1943) (WASS Historical Archive).

On 25th April 1945 the war in Italy came to an end. The tragedy was over, even if much time had still to pass before it could be possible to look at the future with hope and serenity.

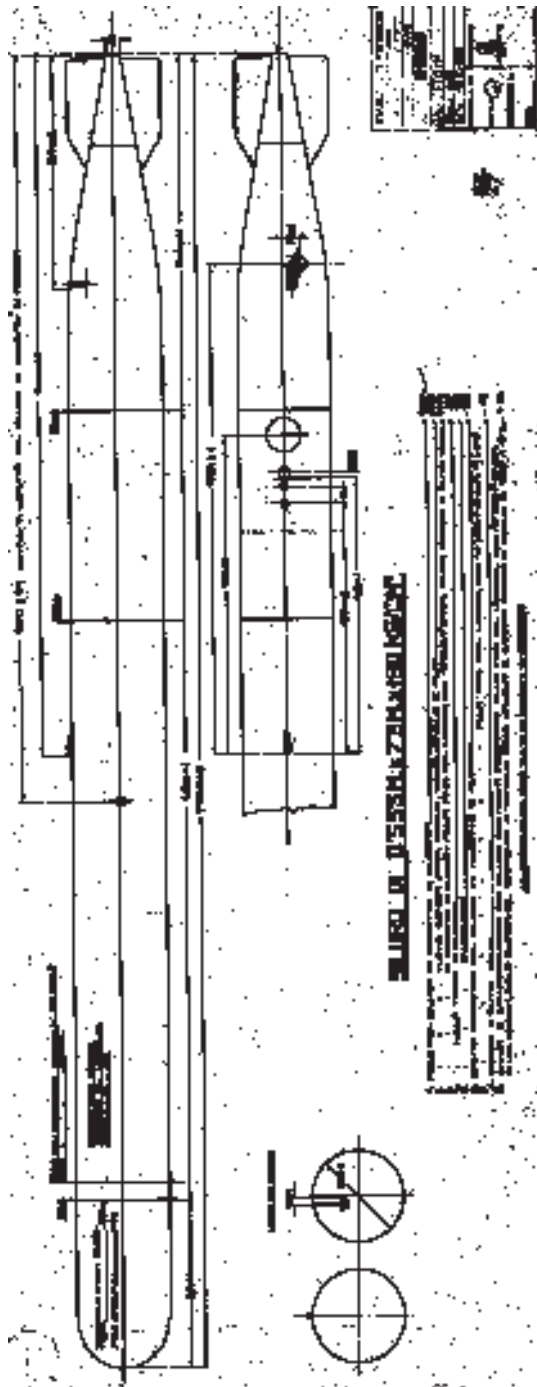
7) – THE POST-WAR PERIOD. BIRTH OF WHITEHEAD MOTO FIDES

On 3rd May 1945, the Yugoslavian Army took possession of the Fiume factory, which, since then, started a new phase of its history.

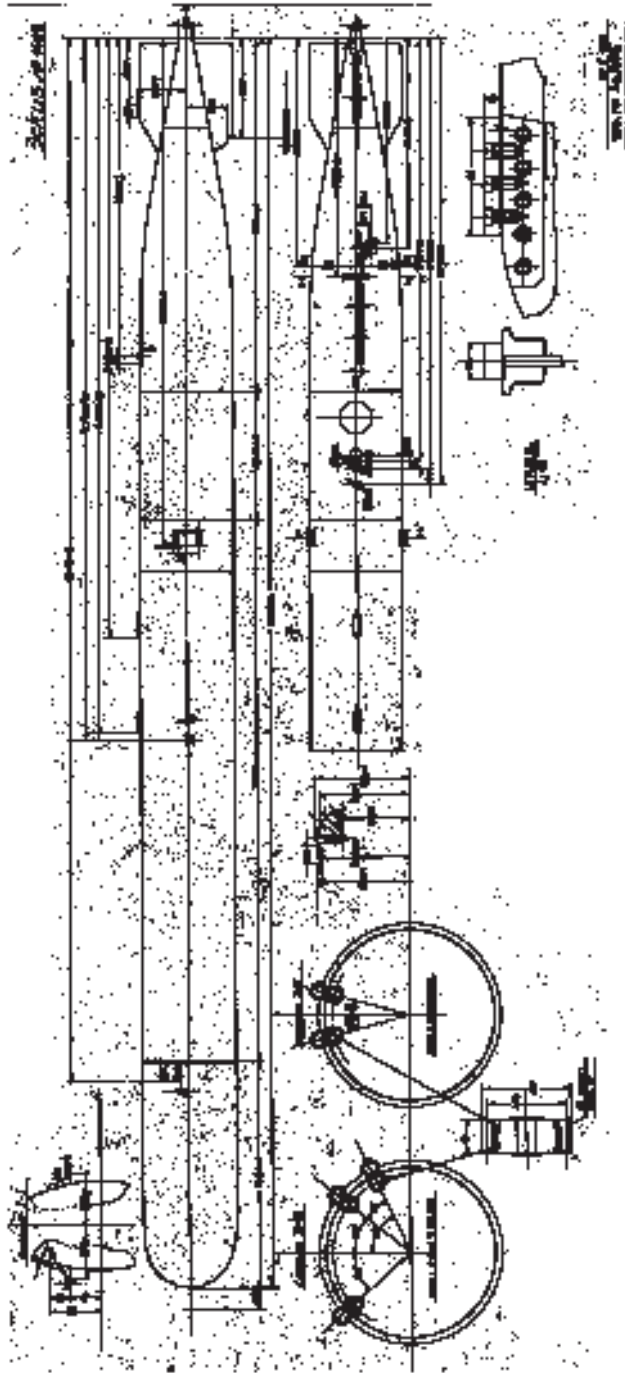
The relations between Yugoslavia and Italy were naturally suffering from the events of the war and some consequences did occur also in matters concerning the torpedo factory. Eng. Arioldo Tuchtan, one of the managers of the plant, was imprisoned for ten months and Eng. Umberto Panigatti, General Manager of the factory, was prosecuted and condemned to ten years of detention, but then released after less than five years.



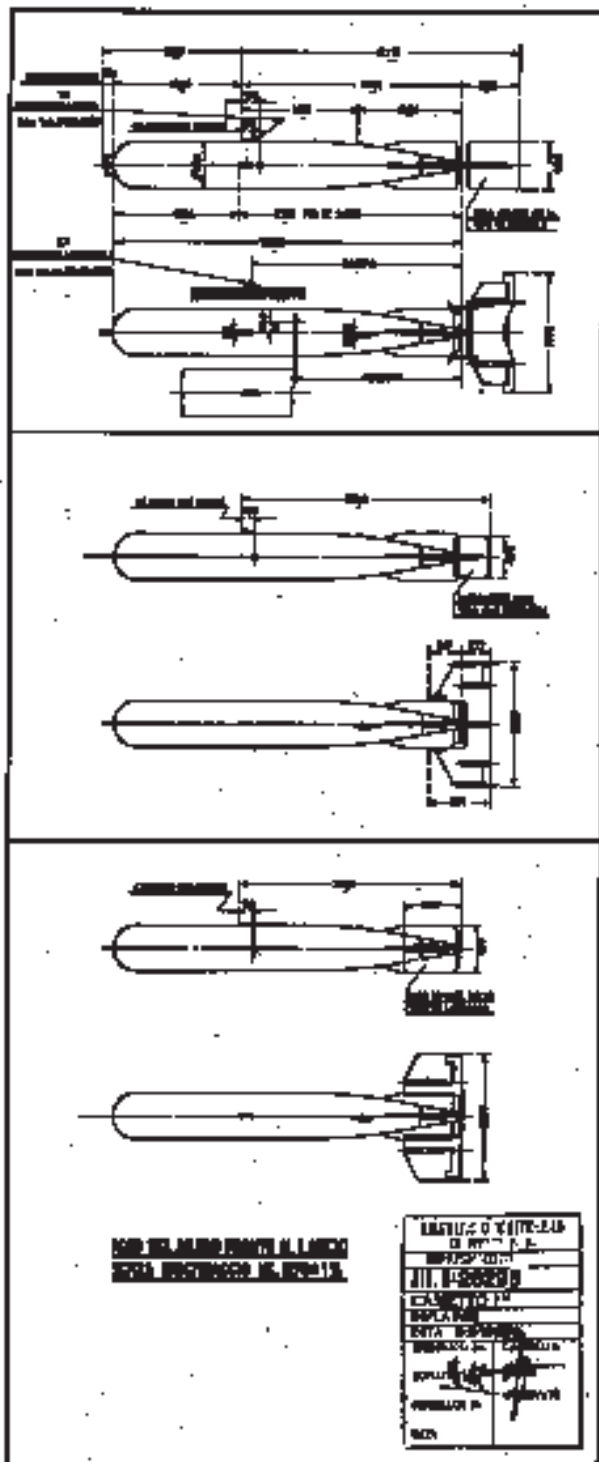
Tab. 20: Torpedo type W250 x 533,4/7,5. Supplied to Argentina in 200 units. Period of delivery 1929 - 1938. 2 cylinders motor (horizontal placed). Speed: 42 knots for a distance of 4.000 m., 26 knots for a distance of 12.000 m. Letters "AR" stands for Argentina (WASS Historical Archive).



Tab.21: Torpedo type W250 x 533,4/7,5. Supplied to Spain in 12 units. Period of delivery 1929. 2 cylinders motor (horizontally placed). Speed: 42 knots for a distance of 4.000 m., 24 knots for a distance of 15.000 m. (WASS Historical Archive).



Tab. 22: Torpedo type W300 x 533,4/7,2. Supplied to URSS in 75 units. Period of delivery 1933 - 1936. 2 cylinders motor (horizontally placed). Speed: 42 knots for a distance of 4.000 m., 26 knots for a distance of 15.000 m. (WASS Historical Archive).



Tab. 23: Torpedo type W200 x 450/3,38. Developed for the German and Italian Air Force near the end of the war (WASS Historical Archive).



Fig. 45: Effects of the 7th and 27th January 1944 bombardments on the Fiume plant (WASS Historical Archive).

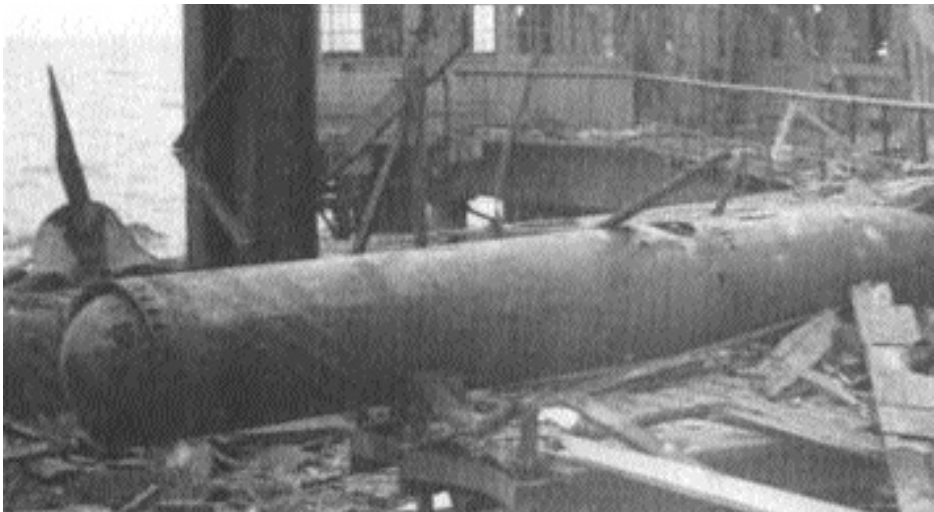


Fig. 46: Effects of the 7th and 27th 1944 January bombardments on the Fiume plant (WASS Historical Archive).

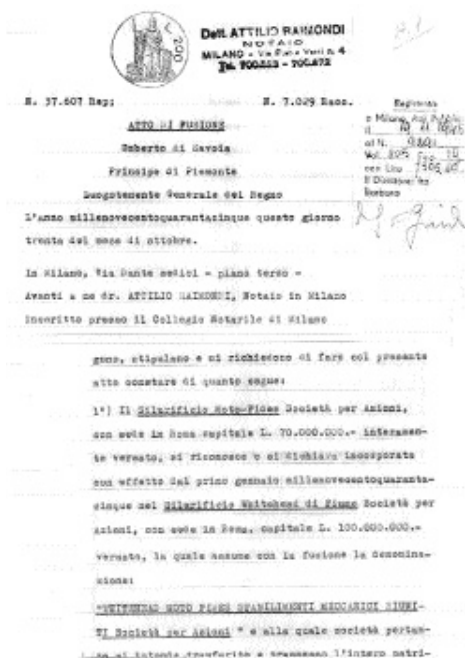
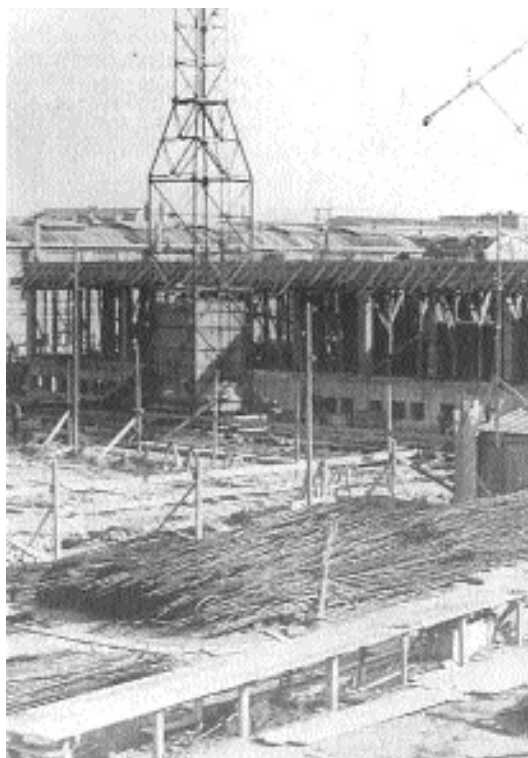


Fig. 47: Notary act, dated 30th October 1945, stating the incorporation of Silurificio Moto Fides in Silurificio Whitehead of Fiume, giving origin to Whitehead Moto Fides Stabilimenti Meccanici Riuniti S.p.A. (WASS Historical Archive).

Fig. 48: Livorno. Reconstruction of the old Silurificio Moto Fides plant, for the new company Whitehead Moto Fides (1945 - 1946) (WASS Historical Archive).



In force of the peace treaty stipulated on 10th February 1947 and of the yugoslavian decree of 9th November 1947, the factory was considered nationalised and confiscated as from the date of 3rd May 1945. Subsequent agreements achieved by a "Mixed Commission" of the two nations, specified the amount of the indemnity.

The Boards of Directors of the Silurificio Whitehead di Fiume (according to the italian laws the company was still in force) and of the Silurificio Moto Fides, took the immediate decision to create a new company formed by the incorporation of the Silurificio Moto Fides in the Silurificio Whitehead di Fiume; to this new company, officially formed on 30 October 1945, with registered office in Rome and plant in Livorno, was given the name of "**Whitehead Moto Fides. Stabilimenti Meccanici Riuniti S.p.A.**" (fig. 47).

The company, utilising part of the damaged buildings of the former Silurificio Moto Fides and the tooling machines not taken away by the german troops in the plant of Fiume Veneto, tried to start again any form of mechanical activity. After a very difficult period, approximately one year long, the acquisition by FIAT, at the end of 1946, of the majority of the Company shares capital, was facilitating the restart of the work. The buildings were restored (figs. 48, 49) and equipped with new machinery suitable to allow the manufacture of the three branches of production chosen, represented by looms for stockings, air compressors and mechanical components for FIAT (fig. 50)

A small group of technicians was however dedicated to the original activity in the torpedo field, starting with the production of spare parts, and with repair and revision of existing torpedoes.

In 1951, according to an initiative of the Italian Navy, it was created a "Group of Study" (U.S.A.S. – Ufficio Studi Armi Subacquee) among the Italian Navy, Whitehead Moto Fides and the "Industria Meccanica Napoletana", a company derived from the conversion of the "Silurificio Italiano" of Naples, the competitor of the Silurificio Whitehead di Fiume since 1924. The most qualified success of USAS, which was located in Baia, a locality near Naples, was the design and the production of the "Lanciabas" a sort of antisubmarine gun, which fired antisubmarine bombs against submarines (figs. 51, 52)

8) – TOWARDS A NEW SUCCESS.

But the important initial step relevant to the revival of the old Whitehead expertise in torpedo technology, was represented by the restoring of the research and development activity which started in 1950-51 with studies on a hydrogen peroxide propulsion system and with the **A.181** wireguided torpedo.

The renewed attentions to torpedo matters allowed the Company to positively answer a request from the Israelian Navy for the supply of weapons of the type

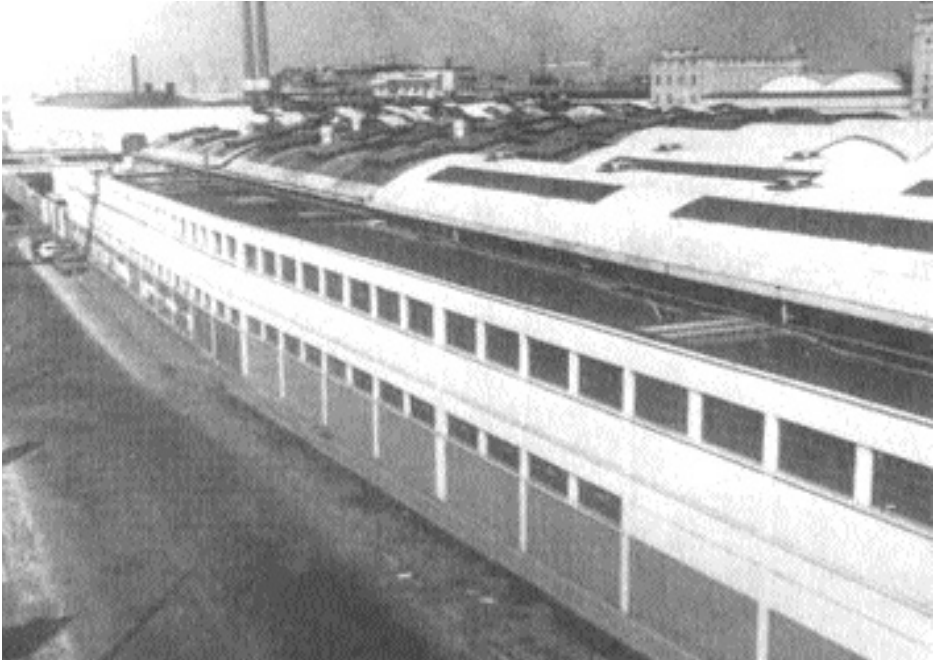


Fig.49: Livorno. The new Whitehead Moto Fides plant is completed (1946) (WASS Historical Archive).



Fig.50: Livorno. Machining of mechanical components for FIAT (1960 - 1970) (WASS Historical Archive).

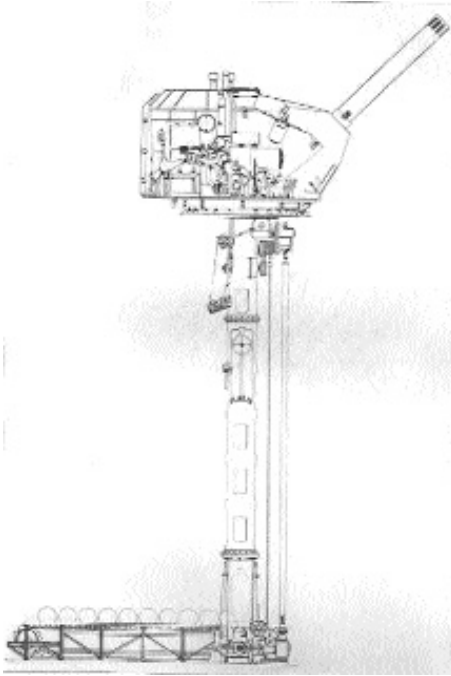


Fig. 51: LanciaBAS (anti submarine bombs thrower) (BAS = Bomba Anti Sommergibile) (1955-1960) (WASS Historical Archive).



Fig. 52: LanciaBAS installed in an italian frigate (1960-1965) (WASS Historical Archive).



Fig. 53: Livorno, 4th May 1957. Visit to Whitehead Moto Fides of Admiral Pecorigaldi, Chief of Staff of the Italian Navy (third from right), accompanied by the President of WMF, Prof. Zamara (to his left) (WASS Historical Archive).



Fig. 54: Livorno, 27th September 1963. Visit to Whitehead Moto Fides of Admiral Giuriati, Chief of Staff of the Italian Navy, accompanied by Eng. Di Stefano, WMF President (to his left) and Eng. Marolli, WMF General Manager (to his right) (WASS Historical Archive).



Fig. 55: Launch of a Mk-44 torpedo manufactured by Whitehead Moto Fides (1966 - 1967) (WASS Historical Archive).

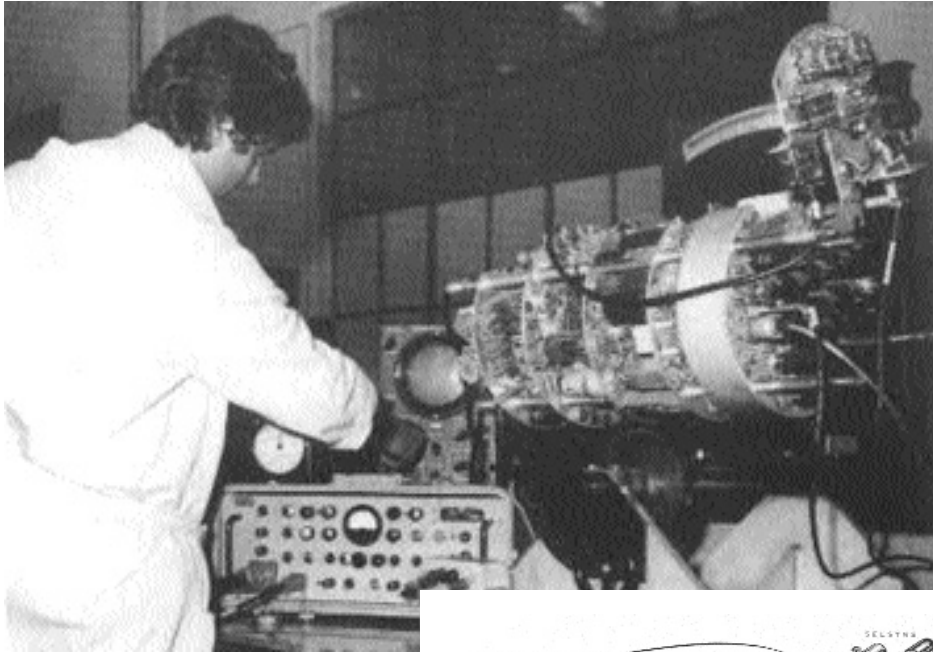


Fig. 56: Test of the electronic panels of a Mk-44 torpedo manufactured by Whitehead Moto Fides (1966 - 1967) (WASS Historical Archive).

Fig. 57: Schematic of the connections of the electromechanical wire guidance system of the A.182 torpedo (1961-1962) (WASS Historical Archive).

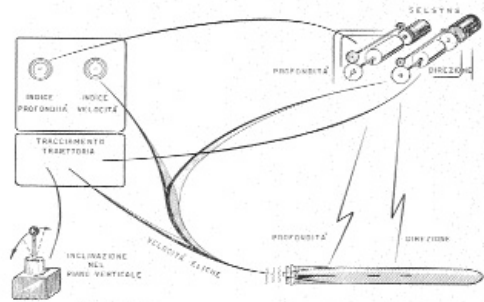


FIGURA 10 - CARATTERISTICHE GENERALI: TRACCIAMENTO DELLA TRAIETTORIA

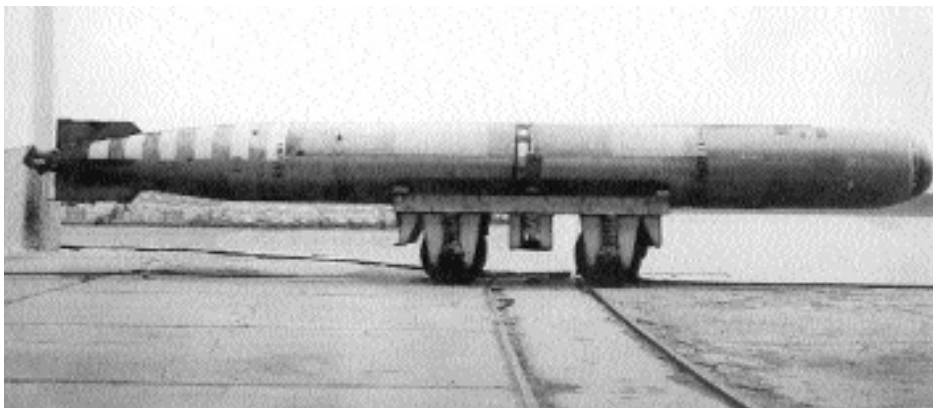


Fig. 58: La Spezia (1967 - 1968). G6e self homing anti ship torpedo ready for a sea trial (WASS Historical Archive).

used during the 2nd world war, and Israel thus became the 33rd nations to have bought Whitehead torpedoes.

In 1958 the USAS was dismissed and all activities (both studies and production) on underwater weapons were concentrated in Livorno at Whitehead Moto Fides (WMF). Gained again the confidence of the Italian Navy (the plant was frequently visited by many Navy authorities), (**figs. 53, 54**) WMF was assigned the contract for the production, under U.S. license, of the **Mk-44** torpedo, the new anti-submarine self-homing electronic weapon (**figs. 55, 56**), which WMF successfully produced (1962-1969) together with other important Italian companies as subsuppliers (Selenia, USEA, other firms of the FIAT group).

Furthermore, on commission of the Italian Navy, the Company developed the heavy weight wire guided torpedo **A.182** (1960 – 1966) (**fig. 57**) derived from the A.181 which, together with the other transition weapons **G6e** (**fig. 58**) and **G62ef** (also known as **Kangaroo**) (**fig. 59**), prepared the Company to the development (1967- 1978) of the much more sophisticated anti-surface-ship and anti-submarine **A.184 weapon system** (**fig. 60**) which, mass produced, represents the torpedo system still in use (with several improvements) in the Italian Navy.

In the period 1960-70, WMF was present also in the field of army weapons, having produced, under licence of the German company Rheinmetall, the **MG 42/59** machine gun (**fig. 61**).

With the development for the Italian Navy of the A.184 weapon system and with the development, within a self-financed program, of the light weight, anti-submarine torpedo **A.244/S** (**figs. 62, 63**), the Company achieved again a relevant position and prestige in the underwater defence systems field, competitive with the other U.S. and European companies of the same sector.

The success gained by the A.244/S torpedo in the export market (in total more than 950 units produced for 15 different nations), allowed the Company to move into the new plant of Salviano (also in Livorno) (**fig. 64**) so to render possible the separation between the military activities and the civilians, although under the responsibility of only one general manager (1977-1978). The plant was equipped with the most advanced instruments and infrastructures adequate to the technological level of the last generation of torpedoes (**figs. 65, 66, 67**).

As to the number of customers of the Company, considering the buyers of the A.244/S torpedo not yet present in the list, the number of nations which have acquired Whitehead torpedoes is increased to 44.

When the “**Gilardini S.p.A.**”, a company operating mainly in the automotive components sector, joined the FIAT Group, WMF, considering the similarity between its civilian production and that of Gilardini, was incorporated into Gilardini S.p.A., so losing its identity of shareholding company (1st October 1979). However, considering the ever improving success of the torpedo programs both in Italy and abroad, in 1985 it was taken the decision to formally separate the military

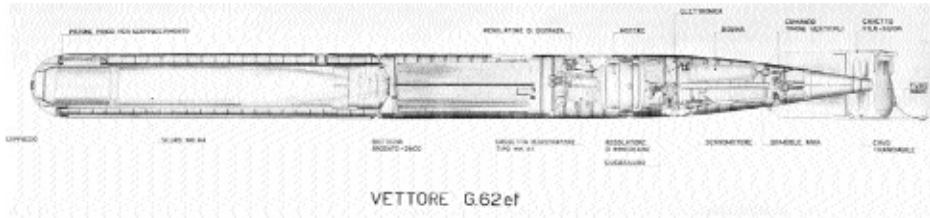


Fig. 59: G62ef torpedo (Kangaroo) (1968-1978). Used on board submarines to attack other submarines. The Kangaroo, controlled and guided by electronic wire guidance, was used to transport at safety distance from the launching submarine, the Mk-44 torpedo contained in it. At such distance, the cap of the Kangaroo could be opened by remote control, thus permitting the Mk-44 to get out from its lodge and look for the target and attack it (WASS Historical Archive).



Fig. 60: A.184 dual purpose torpedo (Anti surface ship and antisubmarine). Equipped with electronic wire guidance and acoustic homing (in service since 1978 with several technical improvements) (WASS Historical Archive).



Fig. 61: MG 42-59 machine gun. Fabricated by Whitehead Moto Fides under licence from Rheinmetall (Germany), for the Italian Army and other foreign nations in the years 1964-1980 (WASS Historical Archive).

and civilian activities, and it was consequently created, within Gilardini, the “**Divisione Moto Fides**” (civilian products) and the “**Divisione Whitehead**” (Whitehead Division - military products) under separate management responsibility (fig. 68).

It was under this society’s configuration that in October 1985 a contract for the development of a new light weight torpedo system, namely the **A.290**, (figs. 69, 70) was stipulated with the Italian Navy, and in 1987 a very important international tender released by the U.S. Navy on an anti-surface-ship low cost weapon, was awarded to Divisione Whitehead of Gilardini (fig. 71).

On 1st January 1990, with the acquisition of “**Misar S.p.A.**”, a company operating in the underwater field of naval mines, “Whitehead Divisione della Gilardini” acquired again the identity of shareholding company, being named “**Whitehead S.p.A.**”, still remaining under the control of Gilardini S.p.A..

On 21st September 1990, to celebrate the 115th anniversary of the foundation of the “**Fabbrica Torpedini di Roberto Whitehead**”, the Company invited in Livorno representatives of all the Navies to which “**Whitehead Co.**”, under the different titles assumed along the years, had supplied its torpedoes since its origin (1875) (figs. 72, 73). Representatives of 22 different Navies (out of the total 42 invited) were present at the ceremony. It was also present Mr. **Peter Francis Whitehead**, great grandson of **Robert Whitehead**, together with his very young son **Peter** (fig. 74).

In 1991, on the basis of an agreement between the Italian and the French Navies, the two national development programs of the new light weight torpedoes, namely the french “**Murene**” and the italian “**A.290**”, were unified in one joint program, common to the two Navies, named “**MU-90**” (figs. 75, 76) the program was subdivided among “**Whitehead S.p.A.**” (50%) and, on the french part, “**DCN St. Tropez**” (26%) and “**Thomson Sintra ASM**” (24%).

9) – BIRTH OF THE WHITEHEAD ALENIA SISTEMI SUBACQUEI (WASS).

The end of the cold war consequent to the fall of the Berlin wall, caused a strong reduction of the military budgets in the whole world and a status of crisis of many of the industries producing defence systems.

The **FIAT Group**, widely present in such sector, adopted the strategic decision to withdraw from all the defence activities, other than those referring to military vehicles, including the underwater field.

FINMECCANICA (IRI state controlled Group), already present in this field with “**Alenia Elsig Sistemi Navali**” (radars, combat systems, sonars, mine disposal systems, etc.), also considering the complementarity of the Whitehead products and the synergy which would have derived by the simultaneous control of the sensors and weapons field, negotiated with FIAT the acquisition of “**Whitehead**

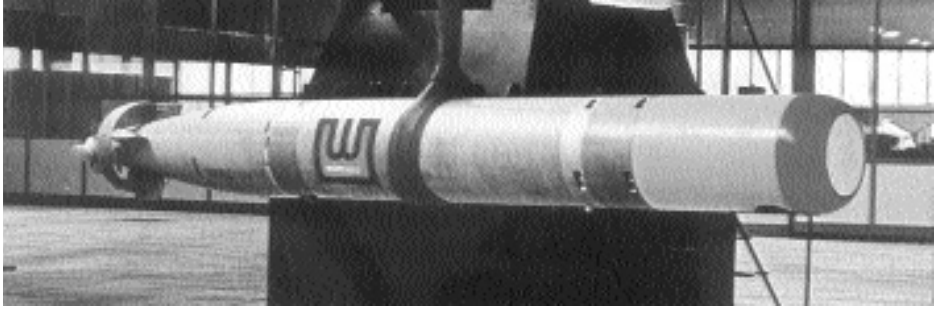


Fig. 62: A.244/S light weight anti-submarine self homing torpedo, designed, developed and manufactured by Whitehead Moto Fides for export. Adopted by 15 different nations (WASS Historical Archive).

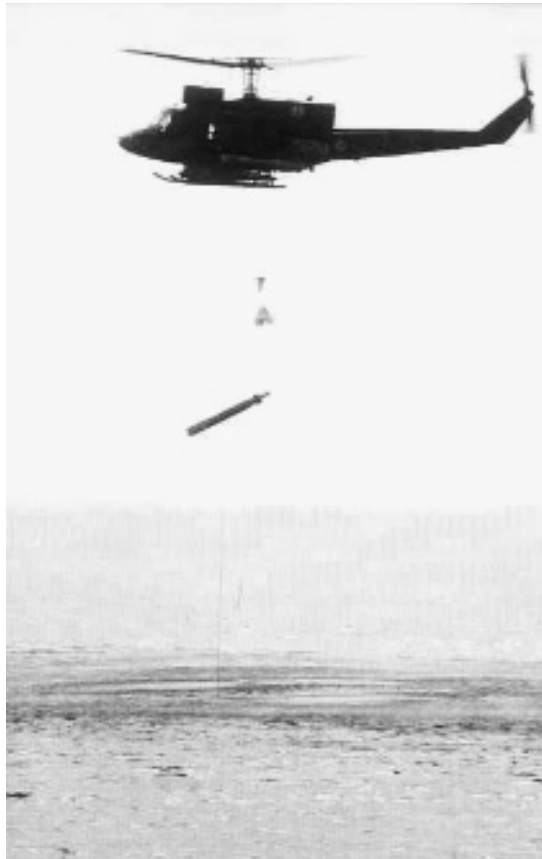


Fig. 63: A.244/S torpedo launched from a hovering helicopter (1977-1978) (WASS Historical Archive).

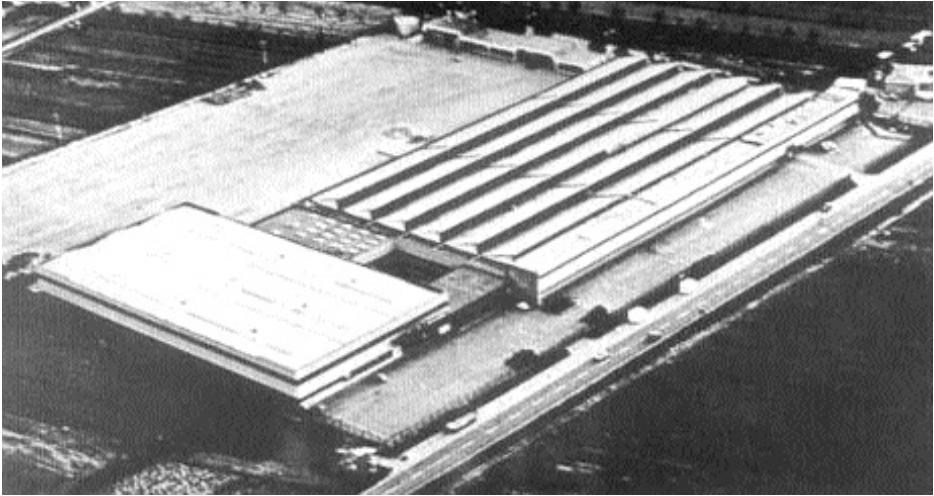


Fig. 64: Aerial view of the new plant of Salviano (Livorno) (1978 - 1979) (WASS Historical Archive).



Fig. 65: Salviano (Livorno). Bridge-crane used for torpedo tests in pool (simulation of helicopter launches and other) (Since 1984) (WASS Historical Archive).

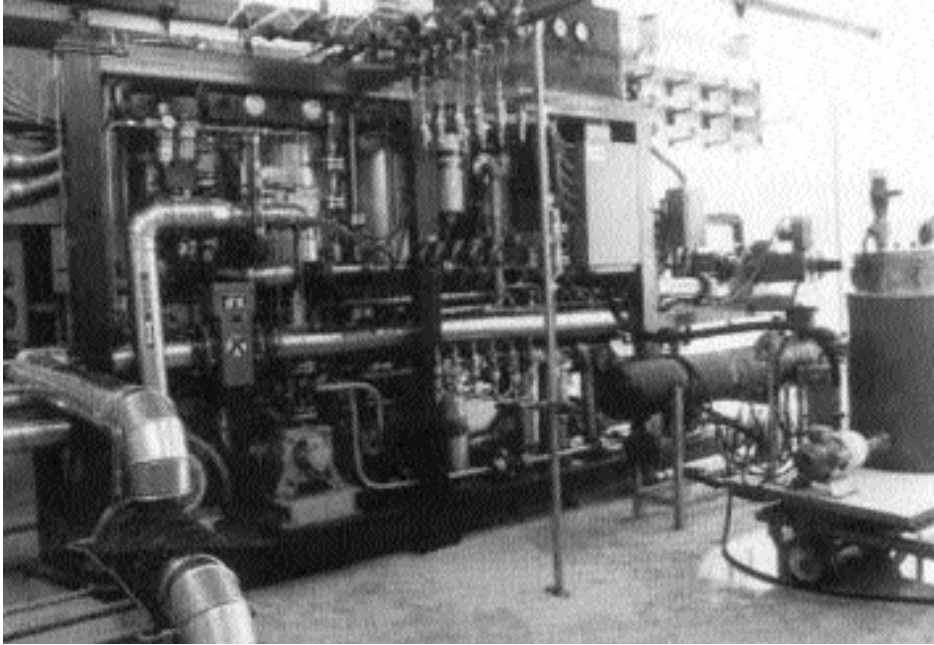


Fig. 66: Salviano (Livorno). Bunker protected torpedo batteries discharge station (Since 1984) (WASS Historical Archive).



Fig. 67: Salviano (Livorno). Test station for A.184 torpedoes (Since 1983) (WASS Historical Archive).

WHITEHEAD DIVISION

• GILARDINI S.p.A. - SALVIANO (LIVORNO) PLANT

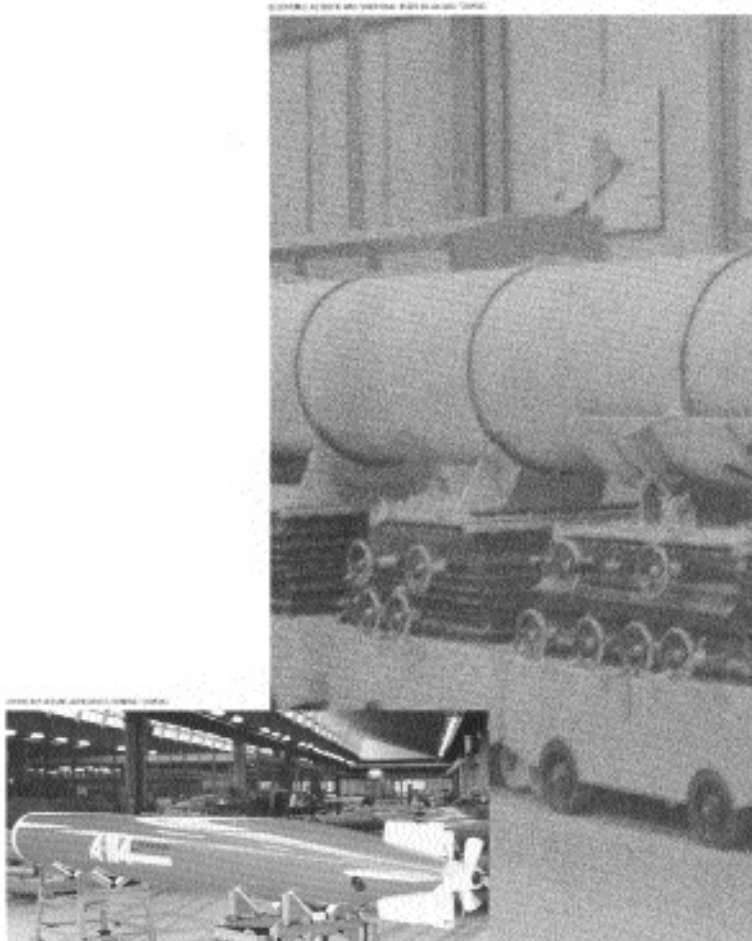


Fig. 68: Gilardini brochure pertinent to the Whitehead Division (1985-1986) (WASS Historical Archive).

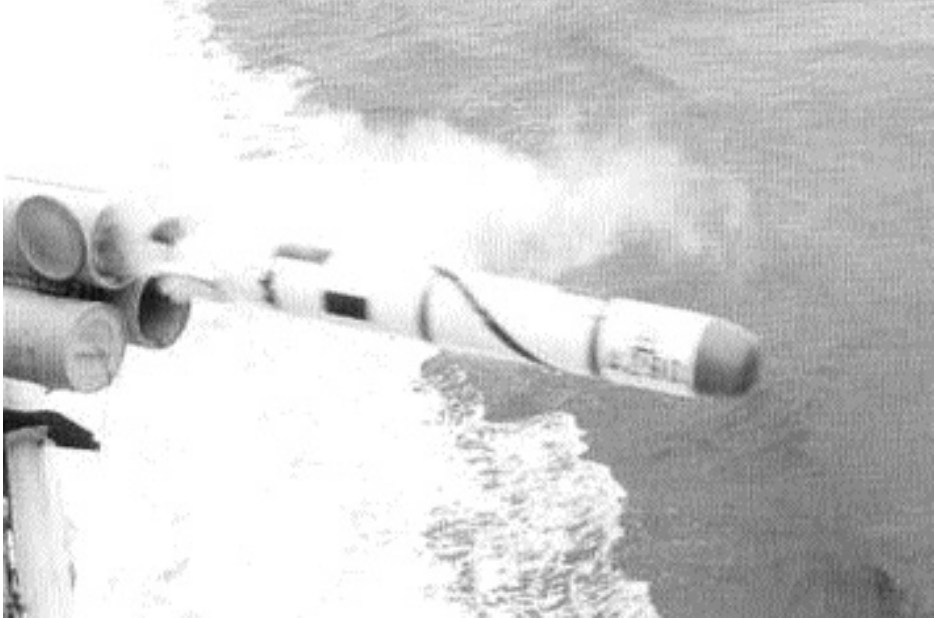


Fig. 69: Launch of an A.290 torpedo from surface vessel (mid 80ies) (WASS Historical Archive).

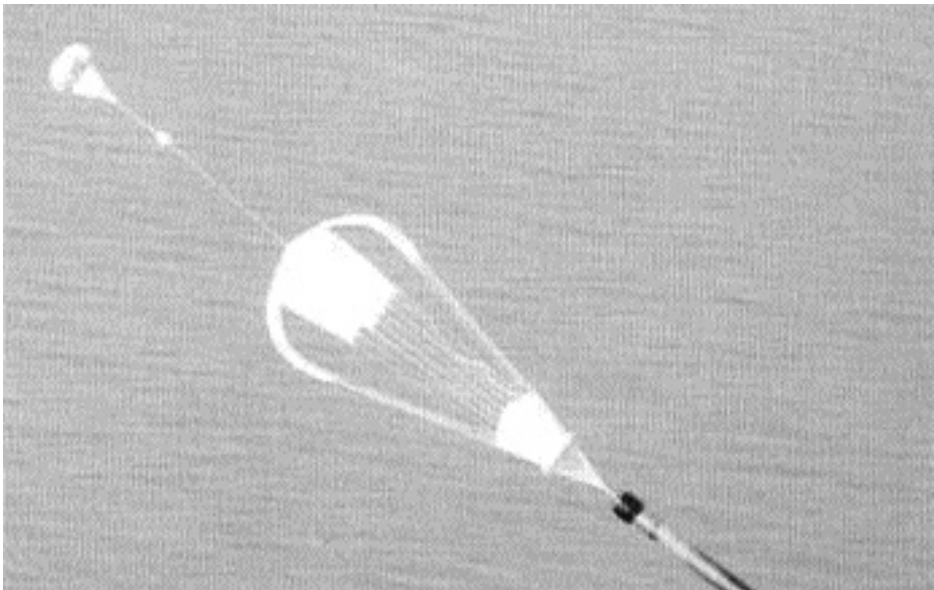


Fig. 70: Launch of an A.290 torpedo from aeroplane (mid 80ies). The air stabiliser (parachute) optimises the air trajectory and the impact of the torpedo on the sea surface. At the impact, the parachute is automatically disconnected (WASS Historical Archive).

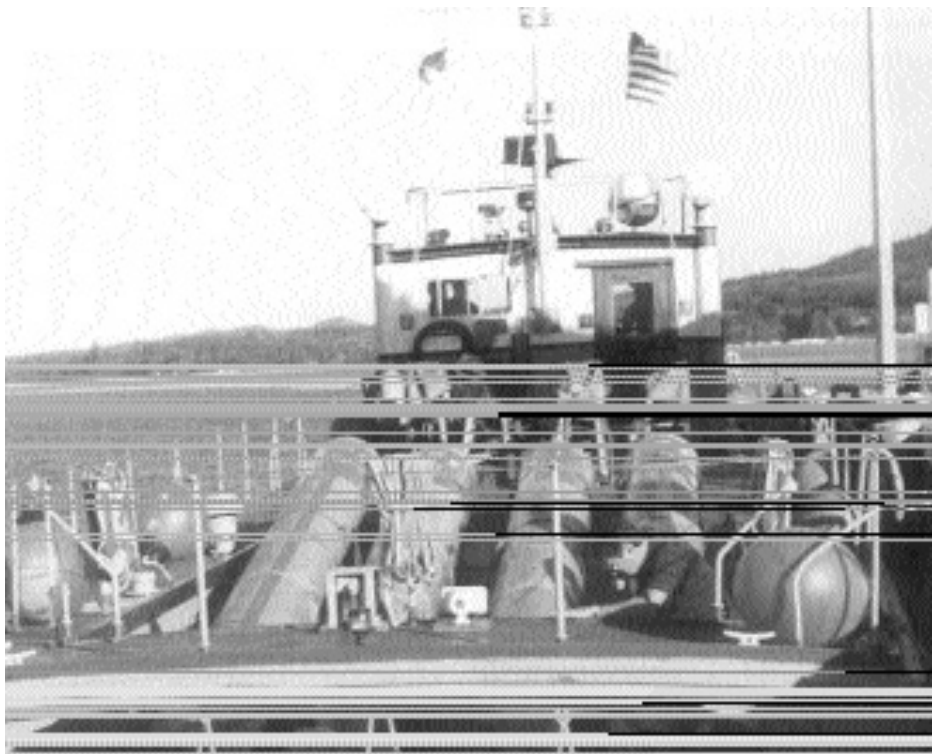


Fig. 71: Sea trials performed in U.S. waters (Keyport - Puget Sound - Washington State) as a consequence of the tender awarded by Divisione Whitehead of Gilardini (WASS Historical Archive).

S.p.A.” and, after having obtained in 1995 50% of the company shares (with management responsibility), completed the operation in 1997 with the acquisition of the remaining 50%. The merging in Whitehead S.p.A. of the **“Divisione Subacquea di Alenia Elsag Sistemi Navali”**, of the **“USEA S.p.A.”** of La Spezia and of the **“Consorzio WELSE”** of Genova, gave origin to the **“Whitehead Alenia Sistemi Subacquei (WASS)**, which, in addition to the Livorno plant of the former Whitehead S.p.A. (where the present top management is located) included also a plant in Pozzuoli (Naples) (fig.77) and a plant in Genova.

The new structure given to the Company, together with the change of the top management, allowed the overcoming of the difficult moment common to all the defence industries of the world; the positive conclusion of the common french-italien development program of the MU-90 torpedo system, which was followed by the production contracts with the Italian, French, German, Danish, Australian and Polish Navies, has permitted the Company to reach again positive economical results and confidence in the future.



Fig. 72: Salviano (Livorno), 21st September 1990. Celebration of the 115th anniversary of the foundation of the Fabbrica Torpedini di Roberto Whitehead. Speech of the President and Managing Director Eng. Petrucci. Adm. Papili represents the Italian Navy Chief of Staff Adm. Ruggiero (WASS Historical Archive).



Fig. 73: Salviano (Livorno), 21st September 1990. Celebration of the 115th anniversary of the foundation of the Fabbrica Torpedini di Roberto Whitehead. A sector of the attendants (WASS Historical Archive).



Fig. 74: Salviano (Livorno), 21st September 1990. Celebration of the 115th anniversary of the foundation of the Fabbrica Torpedini di Roberto Whitehead. Dr. Callieri of FIAT, with Mr. Peter Francis Whitehead, great grandson of Robert Whitehead, and his young son Peter (WASS Historical Archive).

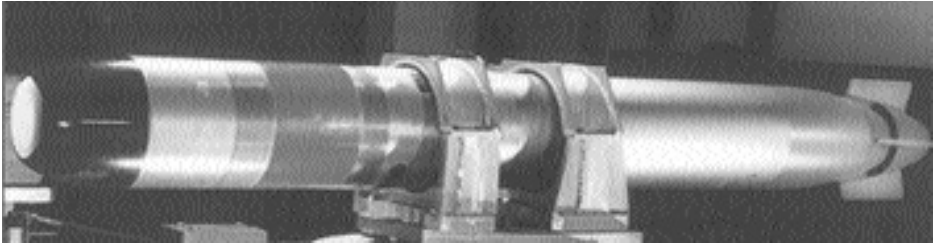


Fig. 75: Livorno. A MU-90 light weight anti-submarine torpedo on a vibration test machine (mid 90ies) (WASS Historical Archive).



Fig. 76: La Spezia. Air drop of a MU-90 torpedo (mid 90ies) (WASS Historical Archive).



Fig. 77: Whitehead Alenia Sistemi Subacquei. The plant of Pozzuoli (Naples) (1998) (WASS Historical Archive).

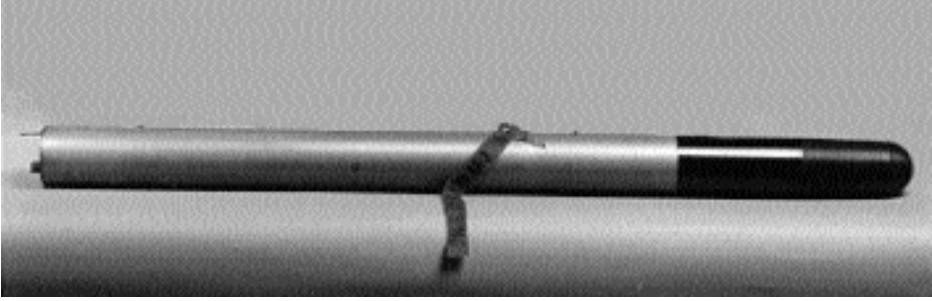


Fig. 78: WASS Salviano (Livorno). Element of the countermeasure system C-303.

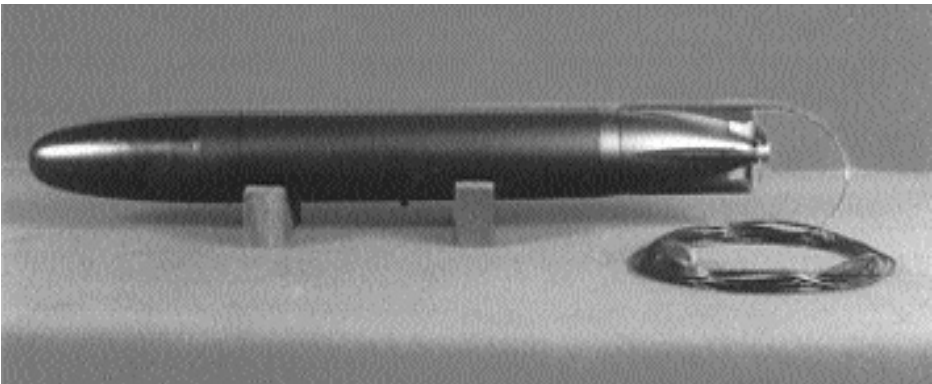


Fig. 79: WASS Salviano (Livorno). Element of the countermeasure system C-303/S.

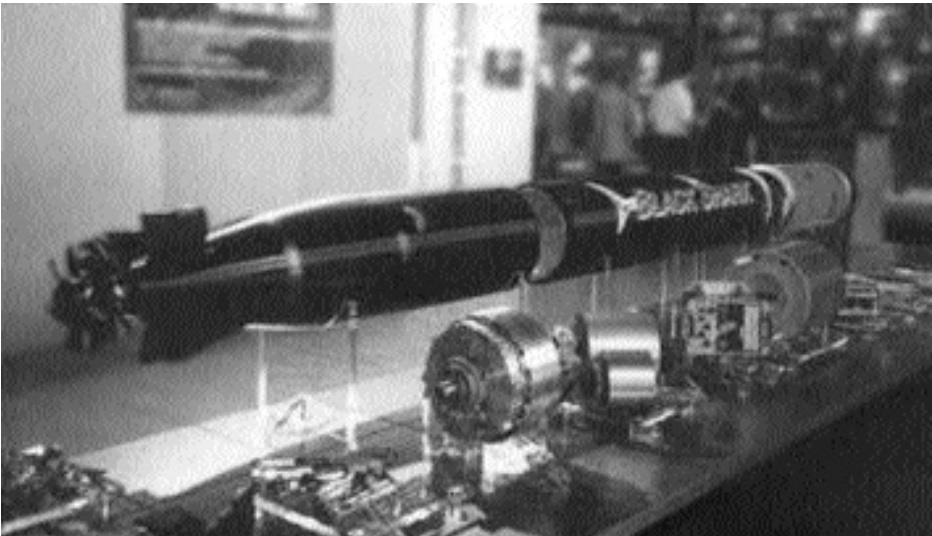


Fig. 80: WASS Salviano (Livorno). Black-Shark wire guided self homing torpedo (2002).



Fig. 81: Whitehead Alenia Sistemi Subacquei. The Plant of Salviano (Livorno) (2002).

The success of the MU-90 program, is accompanied by the success of the countermeasures systems **C-303** and **C-303/S** (figs. 78, 79), the first already supplied to an important non-NATO country and the second attently followed by the U.S. Navy.

As a consequence of the decision of the Italian Navy to acquire U-212 submarines of german origin (Howaldtswerke shipyards) which are supposed to be equipped with the C-303 countermeasures system, WASS is co-operating as subsupplier of “STN Co”. (Germany) for the sonar system and with “Kongsberg Co.” (Norway) for the combat system.

At present WASS is developing, on account of the Italian Navy, a new heavy weight

torpedo system of very advanced characteristics, named “**Black Shark**” (fig. 80), suitable to cover the operational needs of the near and more distant future.

With its simultaneous presence in the complex world of sonar equipment, underwater weapon systems, underwater countermeasures and naval mines neutralisations, WASS, which at present employs a total of 370 subordinates and which is proud to maintain in its title the glourious and historical name of Whitehead, is still keeping a leading position amongst the world industries operating in the underwater defence field (fig. 81).

Sažetak

**“TALIJANSKO RAZDOBLJE” WHITEHEADOVE TVORNICE TORPEDA U RIJECI I
OSNIVANJE WHITEHEADOVE KOMPANIJE MOTO FIDES (WMF – 1945.)
TE WHITEHEAD ALENIA SISTEMI SUBAQUEI (WASS – 1995.) U LIVORNU
Benito Petrucci**

U predgovoru autor se prisjeća vremena u kojemu je kompanija, potekla od Fonderia Metall, ostala u vlasništvu talijanskog kapitala i poslovala u skladu s talijanskim zakonima. To se vrijeme protegnulo na 21 godinu, čime se potvrđuje da je talijanski utjecaj rezultat prisutnosti ljudi talijanskih korijena i široke uporabe talijanskog jezika, privrženosti talijanskoj tradiciji, pa je sve to prožimalo karakter i srž kompanije puno jače nego što bi se očekivalo spominjući samo da je to vrijeme kada je kompanija bila u “vlasništvu Italije”.

Autor potom opisuje stanje kompanije na kraju Prvoga svjetskog rata u sprezi živahnih političkih zbivanja u gradu Rijeci (Fiume). Dijelom u vlasništvu (50%), ali pod punim upravnim nadzorom britanske grupacije Vickers-Armstrong Whitworth, kompanija je bila u procesu stečaja. Jednoj industrijskoj grupaciji iz Livorna na čelu koje je bio Giuseppe Orlando, pošlo je za rukom preuzeti upravu nad tvornicom. Kako stečajna procedura još nije bila potpuno definirana, Orlando je sastavio sporazum sa stečajnim upraviteljem koji ga je ovlastio da rukovodi tvornicom počevši od siječnja 1924., na osnovi ugovora o najmu koji je formalno provela kompanija pod nazivom Stabilimento Whitehead – Società di Esercizio Anonima. Nakon sređivanja stečajnog postupka (19. prosinca 1927.) kompanija Stabilimento Whitehead – Società di Esercizio Anonima dobila je vlasništvo nad kompanijom, i 10. svibnja 1928. ime kompanije mijenja se u Silurificio Whitehead di Fiume. Pod novim nazivom kompanija razvija nove modele torpeda, proširujući proizvodnju i dobivajući nove klijente.

Moto Fides, kompanija koju je 1934. u Livornu osnovao Silurificio Whitehead di Fiume s namjerom da proizvodi motorkotače, brzo je doživjela preobrazbu u proizvođača torpeda pod imenom Silurificio Moto Fides.

Referat opisuje aktivnosti dviju tvornica torpeda za vrijeme ratnog razdoblja, uključujući postavljanje lansirne rampe za testiranje torpeda na moru uz Silurificio Moto Fides, što je realizirano u Porto Santo Stefano. Postrojenje u Livornu teško je bombardirano 28. lipnja 1943., kada je proizvodna aktivnost praktično stala. Dana 17. srpnja 1944. savezničke trupe ušle su u Livorno, a tvornica je bila rekvirirana.

Tvornica u Rijeci koja je nakon 8. rujna (dan kada je Italija potpisala primirje) pala pod kontrolu njemačke vojske, mogla je neometano nastaviti s poslom do početka 1944., kada je stupio na snagu plan decentralizacije prema kojemu se prilično reducirane aktivnosti tvornice premještaju na novu lokaciju pod imenom Fiume Veneto, dok su na lokalitetu Kvarnera – Fiume Carnaro ostale samo aktivnosti vezane uz pokuse na moru.

Tijekom bombardiranja Fiume Carnaro 7. i 27. siječnja 1944., struktura tvornice ozbiljno je oštećena pa su se kao posljedica toga i sve aktivnosti obustavile. Zbog napredovanja savezničkih snaga u srednjoj i sjevernoj Italiji, njemačke su trupe počele napuštati obje tvornice – Fiume Carnaro i Fiume Veneto, uzimajući sa sobom sve strojeve i alate koje su tamo našli.

Autor se potom osvrće na događaje u poslijeratnom razdoblju kada je jugoslavenska vojska 3. svibnja 1945. osvojila Fiume Carnaro, potom nacionalizirala i rekvirirala imovinu.

Dana 30. listopada 1945. dvije talijanske tvornice u Livornu i Rijeci spojile su se u jednu kompaniju pod nazivom Whitehead Moto Fides – Stabilimento Meccanici Riuniti SpA, sa sjedištem u Rimu i postrojenjem u Livornu.

Nova kompanija zadobila je povjerenje talijanske ratne mornarice i tako dobila ugovor za proizvodnju protupodmorničkog torpeda Mk-44 po američkoj licenci. To je bio početak uspješnog razdoblja za vrijeme kojega je razvijeno nekoliko novih torpeda za talijansku ratnu

mornaricu i za neke strane ratne mornarice. Za to vrijeme kompanija je nekoliko puta mijenjala naziv, ali je naziv uvijek sadržavao Whiteheadovo ime.

Kada je privatna grupacija Fiat prodala kompaniju državnoj tvrtki Finmeccanica između 1995. i 1997., kompanija je dobila ime Whitehead Alenia Sistemi Subacquei (WASS), a bila je i dalje prisutna i aktivna u svim sustavima podvodne domene.

Abstract

THE "ITALIAN PERIOD" OF THE WHITEHEAD TORPEDO FACTORY OF FIUME (RIJEKA) AND THE FOUNDATION IN LIVORNO OF WHITEHEAD MOTO FIDES (WMF – 1945) AND OF WHITEHEAD ALENIA SISTEMI SUBACQUEI (WASS – 1995)

Benito Petrucci

In the foreword the author, remembering that the period of time during which the company derived from Fonderia Metalli remained in the property of Italian capitals and under the Italian laws was quite limited (21 years), asserts that the Italian influence, as a result of presence of people of Italian origins, of widespread use of the Italian language, of attachment to Italian traditions, had permeated the character and the attitude of the Company much more than it could be deduced simply considering the "Italian property time".

The author then describes which were the conditions of the Company at the end of the 1st world war, in the eventful political outline of the city of Fiume (Rijeka). Partially owned (50%) but under full management control of the British group Vickers – Armstrong Whitworth, the Company was under bankruptcy procedure. An industrial group of Livorno, headed by Mr. Giuseppe Orlando, succeeded in getting the management of the factory. Because of the not yet fully defined bankruptcy procedure, Orlando stipulated an agreement with the liquidator which entitled him to operate the factory, starting from January 1924, on the basis of a lease contract which was formally executed by a Company with the title of Stabilimento Whitehead – Società di Esercizio Anonima.

After the settlement of the bankruptcy procedure (19th December 1927), the Stabilimento Whitehead – Società di Esercizio Anonima got the ownership of the Company and on 10th May 1928 its name was changed in Silurificio Whitehead di Fiume. Under the new title the Company developed new models of torpedoes, expanding its production and capturing new customers.

Moto Fides, a company founded in 1934 in Livorno by the Silurificio Whitehead di Fiume, with the intent to produce motorcycles, was soon transformed in producer of torpedoes under the name of Silurificio Moto Fides.

The paper describes the activities of the two torpedo factories performed during the period of war, inclusive of the setting up of the launching station to test torpedoes at sea of the Silurificio Moto Fides, realised in Porto Santo Stefano. The plant of Livorno was heavily bombed on 28th June 1943 and, since then, the production activity was practically stopped. On 17 July 1944 the allied troops entered in Livorno and the plant was requisitioned.

The Fiume factory, which after the 8th September (date of the Italian armistice) passed under the control of the German Army, could proceed undisturbed up to the beginning of 1944, when it was put into action a decentralisation plan, by which the production activity of the plant (strongly reduced), was transferred in a locality by the name of Fiume Veneto, whilst in the plant of Fiume Carnaro remained only the activities relating to the sea trials.

The bombardments of Fiume Carnaro on 7th and 27th January 1944, severely damaged the structures of the factory and the activity was consequently cut down. With the advance of the allied forces in central and northern Italy the German troops started to abandon the two plants of Fiume Carnaro and Fiume Veneto, taking with them almost all the existing tooling machines.

The author then refers on the events occurred in the post war period, when the Yugoslavian Army, on 3rd May 1945, took possession of the Fiume Carnaro factory which was thereafter nationalised and requisitioned.

On 30th October 1945 the two italian factories of Livorno and Fiume joined together to form only one company by the name of Whitehead Moto Fides – Stabilimenti Meccanici Riuniti S.p.A., with headquarters in Rome and plant in Livorno.

The new Company gained the confidence of the Italian Navy, thus obtaining a contract for the production, under licence of the U.S.A., of the Mk-44 anti-submarine torpedo. This was the start of a new successful period during which several new torpedoes were developed for the benefit of the Italian Navy as well as many foreign Navies, and during which the Company underwent several changes to its title, all of them, however, including the Whitehead's name.

With the sale of the company from the FLAT private group to the state owned FINMECCANICA, occurred between 1995 and 1997, the Company has assumed the name of Whitehead Alenia Sistemi Subacquei (WASS), continuing to be present and active in all systems of the underwater domain.