delta inženjering

25 godina uspeha.

2014

GODIŠNJI IZVEŠTAJ
ANNUAL REPORT

SADRŽAJ

CONTENTS

delta inženjering

Privredno društvo za konsalting, projektovanje i inženjering

REČ UREDNIKA

Dragi prijatelji,

Kao odgovorna urednica publikacija Delta Inženjeringa, u koje se ubrajaju Godišnjak i News, imam čast i privilegiju da vam predstavim specijalno izdanje Godišnjaka za 2014. godinu. Izlaskom ovog jubilarnog izdanja obeležavamo 25 godina uspešnog poslovanja.

Dozvolite mi da podelim sa vama zadovoljstvo podsećanja na lepe trenutke iz protekle dve i po decenije. Za firmu koja je pokrenula samostalno poslovanje početkom 1990. godine, prva decenija bila je uslovljena teškim ekonomsko-političkim prilikama i predstavljala je veliki profesionalni izazov. Izazov je bio razlog za prvi korak, a kasnije je sve nastalo zahvaljujući entuzijazmu i stvaralačkoj energiji, uz mnogo mudrosti i znanja. Poslovi i investitori su se nizali, uz njih smo sazrevalili i rasli, sticali prijatelje, postali home engineering kompanija za mnoge velike investitorske kuće.

Uspehe smo postizali kroz male i velike ugovore i uspeli smo da osvojimo i zadržimo jednu od najboljih pozicija u oblasti industrijskog inženjeringa.

Dvadeset pet godina je dovoljno dug period za ovo što smo postigli, ali kratak za sve što još nameravamo. Iako smo prepoznatljivi po svom iskustvu, znanju naših zaposlenih i mogućnostima koje nudimo, ostajemo u obavezi da budemo još mnogo bolji i kvalitetniji.

Osoba koja bi bila veoma ponosna na ovaj jubilej je moja majka Mirjana Todorović, čija je podrška prvom čoveku Delta Inženjeringa podsticala i snažila put uspeha tokom svih ovih godina. Njoj želim da posvetim uvodnu reč.

A WORD FROM THE EDITOR

Dear friends,

As an editor of the Delta Inženjering's publications, which include the Yearbook and News, I have the honor and privilege to introduce to you a special edition of the Yearbook for 2014. With coming out of this anniversary edition we celebrate 25 years of successful business operations.

Allow me to share with you the satisfaction of recalling the beautiful moments from the past two and half decades. For a company that started independent business operations in early 1990, the first decade was conditioned by difficult economic and political circumstances and was a great challenge. The challenge was a reason for the first step, and then everything was created thanks to the enthusiasm and creative energy, with a lot of wisdom and knowledge. Jobs and investors followed one after another and we matured and grew with them, gained friends and became home engineering company for many large investors.

Success was achieved through small and large contracts. We managed to win and retain one of the best positions in industrial engineering.

Twenty five years is long enough for what we have achieved, but short for everything else we intend. Although we are known for our experience, knowledge of our employees and the opportunities that we offer, we remain obliged to be much better.

A person who would be very proud of this anniversary is my mother Mirjana Todorović, whose support encouraged first man of Delta Inženjering and gave him the strength over all those years. I want to dedicate this editorial to her.

UVOD

Tog davnog prvog februara 1990. rođena je firma Delta Inženjering. Vođena istinskom željom, ambicijom i ogromnom voljom za uspehom dvočlanog tima iz male kancelarije centra Sava, danas je vodeća firma u oblasti industrijskog inženjeringa.

Čak je i početni izbor poslova kojima se firma bavila, kao što su projektovanje gasnih instalacija i drugih sitnijih mašinskih postrojenja, bio pravi uvod u široko polje industrijskih, projektantskih i izvođačkih poslova.

Vizija prvog čoveka Delta Inženjeringa postala je misija svih njegovih saradnika.

Strpljivim radom, postepenim širenjem, prihvatajući izazove i dobijajući bitke oformljen je tim koji nudi multidisciplinarno projektovanje, kosultantske usluge, proizvodnju, izvođenje, montažu, itd.

Funkcionišemo sinhronizovano, partnerski, po dogovorenim procedurama, standardima i međunarodno utvrđenim pravilima. Pratimo međunarodne zahteve sertifikata.

Godine 2014. izvedeni su projekti i izgrađena je fabrika Henkel u Kruševcu po LEED standardu (Leadership in Energy and Environmental Design) kao najnoviji zahtev nemačkog investitora.

Ponudili smo znanje, iskustvo, energiju i stekli partnere kao što su kompanije: Henkel, FIAT, Messer Group, Aqualia, Srbijagas, Gaspromnjeft, EPS, SGS, Volvo, Husqvarna, Alumil, Holcim, i druge. Tim Delta Inženjeringa otvorio je vrata i ušao u Rusiju, Nemačku, Ukrajinu, Poljsku, Rumuniju, Bugarsku, Austriju, Tursku, Crnu Goru, Republiku Srpsku, Federaciju BiH, Makedoniju i Sloveniju.

INTRODUCTION

Long ago on the first of February 1990 the company Delta Inženjering is formed. Driven by a genuine desire, ambition and a great will to succeed, binomial team from a small office in Sava Center today is a leading company in the field of industrial engineering.

Even the initial choice of jobs that the company dealt with, such as the design of gas installations and other minor mechanical plants, was a real introduction to the wide field of industrial, engineering and construction activities.

The vision of first man in Delta Inženjering has become a mission of his associates.

Patient work, gradually expanding, accepting challenges and winning battles created a multidisciplinary team that provides design, consultancy, services, manufacturing, construction, installation, etc.

We function synchronized, in partnership, according to agreed procedures, standards and internationally established rules. We follow international requirements of the certificates.

In 2014 the projects were executed and the Henkel factory was built in Kruševac by LEED (Leadership in Energy and Environmental Design) standards, as the latest requirement of the German investor.

We have offered our knowledge, experience, energy and acquired partners such as companies: Henkel, FIAT, Messer Group, Aqualia, Srbijagas, Gazprom Neft, EPS, SGS, Volvo, Honda, Holcim, and others. Delta Inženjering's team has opened the door and entered into Russia, Germany, Ukraine, Poland, Romania, Bulgaria, Austria, Turkey, Montenegro, Republika Srpska, Federation of Bosnia and Herzegovina, Macedonia and Slovenia.

1 FINANSIJSKI PREGLED

FINANCIAL SUMMARY

PREGLED REALIZACIJE I DOBITI U 2014. GODINI	REVIEW OF IMPLEMENTATION OF PROFITS IN 2014
PREGLED NAJVEĆIH INVESTITORA U 2014. GODINI	REVIEW OF LARGEST INVESTORS IN 2014
PREGLED IZVOZA U 2014. I PLAN ZA 2015. GODINU	SUMMARY OF EXPORT IN 2014 AND PLAN FOR 2015
PRENOSIVI POSLOVI U 2015. GODINU	TRANSFERABLE OPERATIONS IN 2015
PREGLED PROSEČNIH ZARADA 2009-2014.	SUMMARY OF AVERAGE WAGES FROM 2009 TO 2014 YEAR
PREGLED KADROVSKE STRUKTURE	SUMMARY OF THE PERSONNEL STRUCTURE

PREGLED POKAZATELJA DELTA INŽENJERINGA ZA 2014. GODINU

SUMMARY OF DELTA INŽENJERING INDICATORS FOR THE YEAR 2014

PREGLED REALIZACIJE I DOBITI U 2014. GODINI

Iako su očekivanja za 2014. godinu bila slična kao i za 2013, ipak je došlo do rasta prihoda za oko 31%, kao i rasta dobiti na oko 4% od ukupnog prometa.

Ostvareni promet u 2014. godini je 12.500.000 EUR, za razliku od 2013, kada je promet bio 8.851.000 EUR. Zastoj investicija u zemlji u 2014. godini odrazio se i na poslovanje Delta Inženjeringa. Poslovi Delta Inženjeringa su smanjeni unutar NIS-a, a posebno u EPS-u, gde se u prošloj godini planirao prihod od 3,7 miliona EUR.

U 2014. godini naš najveći investitor je Henkel sa kojim smo sklopili ugovore o projektovanju i izgradnji fabrika na dve lokacije. Jedan ugovor se odnosi na projektovanje i izgradnju Fabrike Henkel u Kruševcu, a drugi se odnosi na projektovanje i izgradnju Fabrike Henkel Ceresit u Bileći.

U 2014. godini je bilo projektantskih usluga kao i u 2013, a više inženjering poslova nego prethodne godine. Projekti koji su u fazi realizacije su Henkel Bileća i Pezos u Rumenci. Najznačajniji je projektantski ugovor za legalizaciju objekata u Železari Smederevo koji se prenosi u 2015. godinu. Posebnu pažnju pridajemo projektima koji su u kompetenciji Sektora za tretman otpadnih voda, a koji su sve više finansirani iz fondova EU i EBRD.

REVIEW OF IMPLEMENTATION OF PROFITS IN 2014

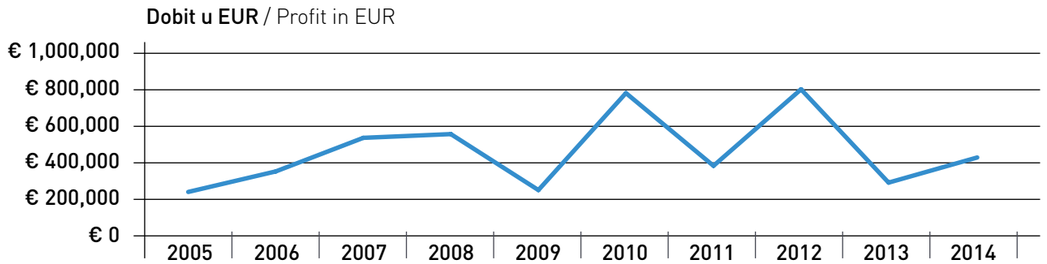
Although expectations for 2014 were similar as for 2013, there has been a growth in revenue of around 31% and profit growth at approximately 4% of the total turnover.

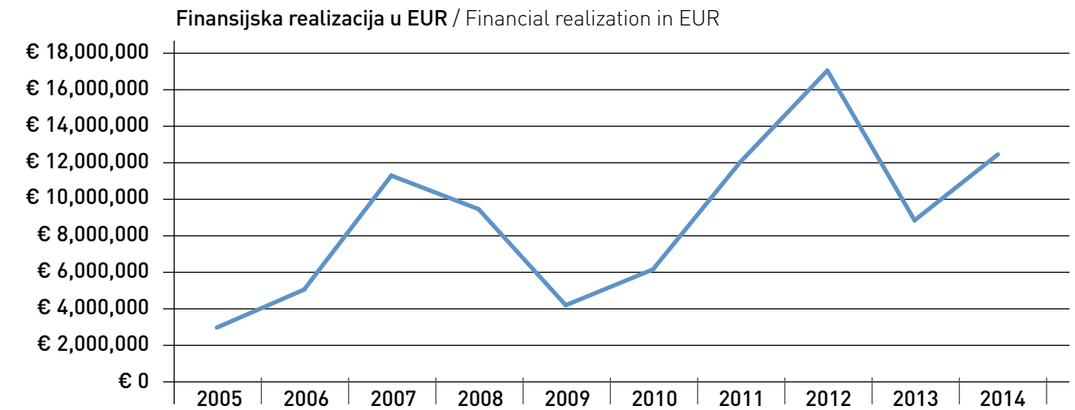
Turnover in 2014 was € 12,500,000, unlike in 2013 when turnover was € 8,851,000. Delay of investments in the country affected the activities of Delta Inženjering in 2014. Delta Inženjering activities were reduced within the NIS, especially in EPS, where was planned revenue of 3.7 million euros in the last year.

In 2014 our largest investor was Henkel, with whom we signed the contracts for design and construction of factories in two locations. The first contract refers to the design and construction of the factory Henkel in Kruševac, and the second to the design and construction of the factory Henkel Ceresit in Bileća.

In 2014 there were design services, as well as in 2013, but far more engineering jobs than in the previous year. Projects which are in the realization phase: Henkel Bileća and Pezos Rumenka. The most important is a design contract for legalization of facilities in Železara Smederevo, which is transferred in 2015. Particular attention is given to the projects falling under the scope of the Wastewater Treatment Sector in Delta Inženjering that are increasingly financed from EU funds and the EBRD.

Godina Year	**Finansijska realizacija u EUR** Financial Realization in EUR	**Dobit u EUR** Profit in EUR	**Procenat** Percentage
2005	**€ 2,900,381**	**€ 244,150**	**8.42%**
2006	**€ 5,028,221**	**€ 358,532**	**7.13%**
2007	**€ 11,351,600**	**€ 538,600**	**4.74%**
2008	**€ 9,443,850**	**€ 562,066**	**5.95%**
2009	**€ 4,142,354**	**€ 254,771**	**6.15%**
2010	**€ 6,182,608**	**€ 778,260**	**12.59%**
2011	**€ 12,014,345**	**€ 382,260**	**3.18%**
2012	**€ 17,102,226**	**€ 800,000**	**4.68%**
2013	**€ 8,851,000**	**€ 296,000**	**3.34%**
2014	**€ 12,500,000**	**€ 420,000**	**3.36%**

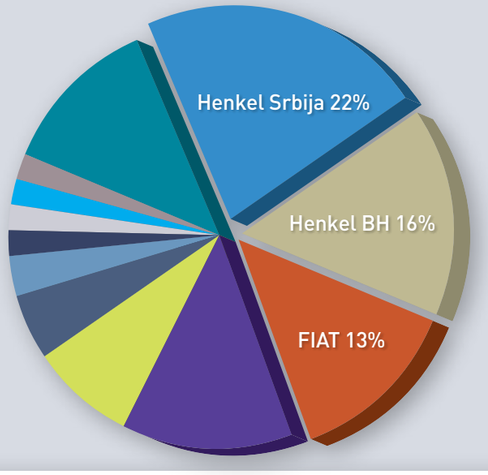




PREGLED NAJVEĆIH INVESTITORA U 2014. GODINI

Najveći investitori u 2014. godini su Henkel, FIAT, Bambi Požarevac i Messer.

U 2015. godini neophodno je dinamičnije nastupati izvan granica Srbije, što podrazumeva zemlje regiona (bivša Republika Makedonija, Federacija BiH, Republika Srpska, Crna Gora), zbog skromnog broja investicija na lokalnom nivou.



	Investitori / Investors	RSD	EUR	%
	Henkel Srbija	313.203.354,59	2,654,265.72	22%
	Henkel BH	220.891.485,32	1,871,961.74	16%
	FIAT Automobili Srbija / Automobiles Serbia	186.378,889.03	1,579,482.11	13%
	Koncern Bambi	184.910.535,73	1,567,038.44	13%
	MESSER Tehnogas	118.336.000,55	1,002,847.46	8%
	RTB Bor - TIR Bor	76.167.930,64	645,490.94	5%
	NIS - Rafinerija nafte Pančevo / Oil Refinery Pančevo	42.822.500,00	362,902.54	3%
	JP TRANSNAFTA	28.191.553,79	238,911.47	2%
	Srpska fabrika stakla / Serbian Glass Factory	26.808.355,02	227,189.45	2%
	Mont Energo	23.338.208,96	200,131.00	2%
	Nestle Adriatic S	21.578.750,00	182,870.76	2%
	Ostali / Others	177.172.401,38	1,476,436.68	12%
	UKUPNO / Total	1.419.799.965,00	12,009,528.31	100%

REVIEW OF LARGEST INVESTORS IN 2014

The largest investors in 2014 were Henkel, FIAT, Bambi Požarevac and Messer.

In 2015 it is necessary to more dynamically perform beyond the borders of Serbia. It includes countries in the region (the former Republic of Macedonia, the Federation of Bosnia and Herzegovina, Montenegro), due to the modest number of investments at the local level.

PREGLED IZVOZA U 2014. I PLAN ZA 2015. GODINU

Izvoz se prvenstveno odnosio na izvoz znanja - projektovanje, usluge projekt menadžmenta i vođenje gradilišta.

U 2014. je sklopljen ugovor za projektovanje i izgradnju fabrike Henkel-Ceresit u Bileći koji se nastavlja u 2015. kao najznačajniji u planu izvoznih poslova.

SUMMARY OF EXPORT IN 2014 AND PLAN FOR 2015

Export are primarily related to the export of knowledge - design services, project management and site management.

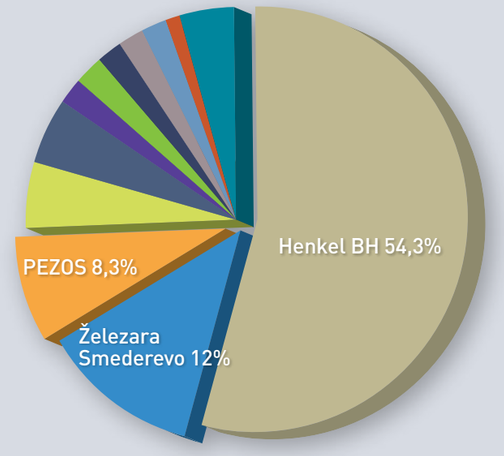
In 2014 Delta Inženjering signed a contract for the design and construction of the factory Henkel-Ceresit Bileća that continues in 2015 as the most important in the field of export business.

PRENOSIVI POSLOVI U 2015. GODINU

Poslovi ugovoreni u 2014, čija je realizacija planirana za 2015. godinu

TRANSFERABLE OPERATIONS IN 2015

Projects contracted in 2014, which realization is expected in 2015



	Investitori / Investors	EUR	%
	Henkel BH d.o.o. Sarajevo	3,610,837.00	54,3%
	Železara Smederevo	794,000.00	12%
	PEZOS Export import	550,000.00	8,3%
	JP EPS	340,000.00	5%
	RTB Bor	300,000.00	5%
	JP TRANSNAFTA	160,000.00	2,4%
	JKP Beogradske elektrane	155,000.00	2%
	Louis Berger - PPOV Kraljevo	150,000.00	2%
	JKP 2. oktobar Vršac (Aqualia)	150,000.00	2%
	NIS a.d.	126,500.00	2%
	FIAT	65,000.00	1%
	Ostali / Others	250,000.00	4%
	UKUPNO / Total	6,651,337.00	100%

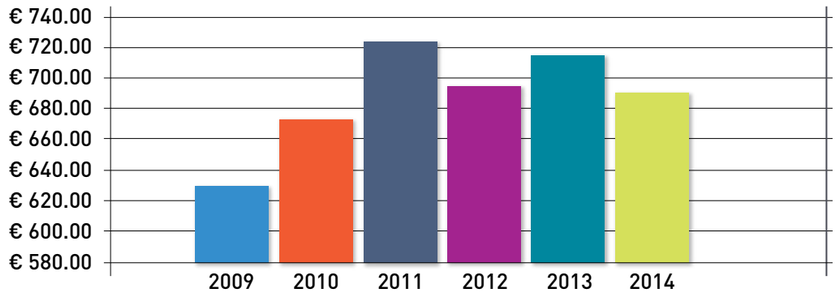
PREGLED PROSEČNIH ZARADA OD 2009 – 2014.

Prosečna neto zarada u 2014. godini je 83.000 RSD i u odnosu na 2013. beležimo porast od 1,2%. Imajući u vidu da je realan porast zarada kontinuirano zaposlenih u Delta Inženjeringu iznosio 3,3%, planirano povećanje zarada u 2014. neće u skladu sa očekivanim rastom poslova dostići 5%.

Godina Year	Prosečne neto zarade EUR The average net salary in EUR	DIN	NBS kurs Exchange rate of the National Bank of Serbia
2014	€ 690.00	83.000,00	120,9583
2013	€ 715.27	82.000,00	114,6421
2012	€ 695.25	78.991,02	113,6156
2011	€ 724.82	75.845,89	104,6409
2010	€ 673.12	71.012,69	105,4982
2009	€ 629.71	60.381,86	95,8888

SUMMARY OF AVERAGE WAGES FROM 2009 TO 2014 YEAR

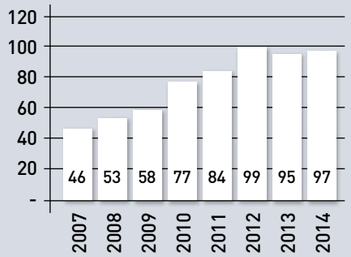
The average net wage in 2014 was 83,000 RSD and compared to 2013 we notice an increase of 1.2%. Taking into account that the real increase of wages continuously employed in Delta Inženjering was 3.3%, the planned increase of wages in 2014 will not reach 5% in line with the expected growth of operations.



*Date su prosečne neto zarade u decembru mesecu svake godine po kursu na dan 31.12.
Given are the average net salary in December of each year at the exchange rate of 31.12.

PREGLED KADROVSKE STRUKTURE

Osnovno obeležje kadrovske strukture u 2015. godini čini konsolidovani podmlađeni menadžerski kadar, koji je spreman da se, u sprezi i uz podršku iskusnog dugogodišnjeg tima, nosi sa svim izazovima sve zahtevnijeg tržišta.
Broj zaposlenih se neće menjati u odnosu na 2014.



Ukupan broj zaposlenih
Total number of employees

SUMMARY OF THE PERSONNEL STRUTURE

The main characteristic of the personnel structure in 2015 makes rejuvenated and consolidated managerial staff that is willing, in conjunction and with support of an longtime experienced team, to deal with all the challenges of the increasingly demanding market.
Number of employees will not be changed in comparison with 2014.

ZAKLJUČAK

Posledice negativnih makroekonomskih trendova, koji su zabeleženi i u 2014, kao i gubitak vremena u planiranju ozbiljnih investicija, odrazili su se na poslovanje.

U 2015. godini potrebno je nastaviti sa merama koje su bile planirane i dobrim delom realizovane u 2014. godini, a to su:

- Osposobiti veći broj projektanata za obavljanje aktivnosti na izvođenju radova;
- Povećati efikasnost i produktivnost obavljanja poslova u svim segmentima našeg rada (boljom koordinacijom kadrovima u biroima, pravilnom pripremom poslova, korišćenjem novih softverskih paketa radi ubrzanja procesa rada, boljom kontrolom rada svih zaposlenih u Delta Inženjeringu);
- Postojano raditi na smanjenju troškova;
- Dinamičnije nastupati na domaćem i tržištu regiona;
- Planirati projekte po principu *know-how*, koji sa sobom nose i veću akumulaciju zarade - naročito u sektoru tretmana voda i ekologije, transportnih sredstava i skladištenja, automatskih sistema upravljanja i instrumentacije.

U svemu tome potrebno je do maksimuma iskoristiti naše poznavanje lokalnog i tržišta regiona, poznavanje lokalnog zakonodavstva, procedura i pravila, kao i unaprediti način vođenja projekata.

CONCLUSION

The consequences of negative macroeconomic trends recorded in 2014, as well as a waste of time in planning serious investments have been reflected in the business.

In 2015 it is necessary to continue with the measures that have been planned and largely implemented in 2014, namely:

- Enable large number of designers to perform activities at the execution of works;
- Increase efficiency and productivity of tasks performance in all areas of our work (better coordination with staff in offices, proper task preparation, using of new software package to accelerate process of work, better control of all employees in Delta Inženjering);
- Constantly work to reduce costs;
- Dynamically compete in domestic and regional market;
- Plan projects on know-how base, which carry a greater accumulation of profits - especially in the Ecology and Water Treatment Sector, means of transport and storage, automated management systems and instrumentation.

In all of this it is necessary to make maximum use of our knowledge of the local and regional markets, knowledge of local legislation, procedures and rules, as well as to improve the method of project management.






2 POSLOVI DELTA INŽENJERINGA

DELTA INŽENJERING ACTIVITIES

FIAT AUTOMOBILI SRBIJA, OD 2008. DO DANAS	FIAT AUTOMOBILES SERBIA, FROM 2008 TILL TODAY
RAFINERIJA NAFTE PANČEVO	OIL REFINERY PANČEVO
RAFINERIJA NAFTE BEOGRAD	OIL REFINERY BEOGRAD
RAFINERIJA NAFTE BROD	OIL REFINERY BROD
PODZEMNO SKLADIŠTE GASA BANATSKI DVOR	UNDERGROUND GAS WAREHOUSE IN BANATSKI DVOR
RUDARSKI BASEN KOLUBARA	RB KOLUBARA
TERMOELEKTRANA NIKOLA TESLA (TENT B) Sistem za kontrolu kvaliteta i kvantiteta uglja	THERMAL POWER PLANT NIKOLA TESLA (TENT B) System for Quality and Quantity Control of Coal
ŽELEZARA SMEDEREVO	ŽELEZARA SMEDEREVO
HENKEL	HENKEL
FABRIKA SLADOLEDA NESTLE	ICE CREAM FACTORY NESTLE
HUSQVARNA	HUSQVARNA
ALUMIL	ALUMIL
VOLVO	VOLVO
HOLCIM	HOLCIM
ARCELOR MITTAL Zenica	ARCELOR MITTAL Zenica
MONBAT PLC	MONBAT PLC
MESSER	MESSER
IMG	IMG

FIAT AUTOMOBILI SRBIJA, OD 2008. DO DANAS

Izvršena je kompletna rekonstrukcija fabrike FIAT na površini od 1,4 miliona kvadratnih metara.

Radovi su podrazumevali građevinske radove na pogonima, izgradnju krovnih konstrukcija, instalaciju najsavremenije opreme i proizvodnih sistema svetske klase. Zona naših radova obuhvatala je 40 000 m^2.

U krugu fabrike je urađen eko-park pod nazivom Biolago. Celina je formirana iz većeg (p = 1200 m^2, v = 1300 m^3) i manjeg jezera (p = 120 m^2 i v = 150 m^3).

U delu pod nazivom prečišćavanje otpadnih voda, završene su tri celine Katak I, II i III.

Bilo je neophodno da postojeće postrojenje za prečišćavanje otpadnih voda bude dodatno rekonstruisano, odnosno prilagođeno novim zahtevima buduće lakirnice, kao i budućeg pogona za farbanje branika u pogledu količine i kvaliteta tehnoloških otpadnih voda.

Prvom fazom rekonstrukcije (PPOV Katak I Faza), koja je obavljena u periodu od novembra 2009. godine do aprila 2010. godine, postrojenje za prečišćavanje otpadnih voda prečišćava otpadnu vodu do nivoa kvaliteta potrebnog i dovoljnog za ispuštanje u gradski kanalizacioni sistem.

Druga faza rekonstrukcije postrojenja (PPOV Katak II Faza) treba da omogući prečišćavanje dva odvojena toka tehnološke otpadne vode, kao i obradu mulja.

Koncept prečišćavanja tehnoloških otpadnih voda, predviđen za III fazu (Katak III), zasnovan je na fizičko-hemijskom tretmanu tehnološke otpadne vode, uz proces uklanjanja ulja i masnoća.

Površina od oko 40 000 m^2, na kojoj se već odavno odvija montaža *fijata 500L*, pokrivena je sprinklerskom instalacijom koja je montirana pod i u okviru krovne konstrukcije zgrade.

FIAT AUTOMOBILES SERBIA, FROM 2008 TILL TODAY

A complete reconstruction of the factory FIAT was carried out on the area of 1.4 million square meters.

The works included construction works on the plants, the construction of roof structures, installation of modern equipment and world-class manufacturing systems. The zone of our works was area of 40 000 m^2.

Within the factory area was made Echo Park called Biolago. The whole is formed from a larger (p = 1200 m^2, v = 1300 m^3) and a smaller lake (p = 120 m^2 iv = 150 m^3).

In the section titled wastewater treatment, three parts were completed: Katak I, II and III.

It was necessary to reconstruct the existing wastewater treatment plant, i.e. to adjust it to the new demands of the future Paint Shop as well as the future Bumper Paint Shop in terms of quantity and quality of process wastewater.

Within the first phase of reconstruction (WWTP Katak Phase I), which was completed during November 2009 – April 2010, the wastewater treatment plant purified wastewater to level of quality necessary and sufficient for discharge into the municipal sewage system.

The second phase of reconstruction (WWTP Katak Phase II) should enable treatment of sludge and two separate flows of process wastewater. The concept of industrial wastewater treatment for Phase II is based on the separation of wastewater flows.

The concept of process wastewater purification, scheduled for Phase III (Katak III), is based on the physical-chemical treatment of process wastewater, with the process of oil and grease removing.

Surface area of 40 000 m^2, on which has been carried out assemble of Fiat 500L for a long time, is covered by a sprinkler installation mounted under and within the roof structure of the building.

RAFINERIJA NAFTE PANČEVO

OIL REFINERY PANČEVO

Jedna od najznačajnih investicionih aktivnosti u našoj zemlji jeste modernizacija Rafinerije nafte Pančevo.

Modernizacija RNP obuhvata izgradnju novih proizvodnih i pomoćnih postrojenja i rekonstrukciju dela postojećih postrojenja.

S obzirom na specifičnost i kompleksnost budućih postrojenja, investitor je kao projektanta tehničke dokumentacije dela tih postorojenja angažovao firmu CBI Lummus iz Brna, Češka Republika, koja poseduje značajno iskustvo i znanje kada su u pitanju ovakve vrste objekata.

Kao nosilac izrade tehničke dokumentacije angažovan je Delta Inženjering, čiji je tim projektanata izvršio usklađivanje dokumentacije CBI Lummus sa domaćim propisima i izradio dodatne proračune i projekte.

One of the most significant investment activity in our country is the Pančevo Oil Refinery modernization.

Modernization of the Pančevo Oil Refinery will be achieved through the construction of the new production and ancillary facilities and reconstruction of parts of existing plant.

Given the specificity and complexity of future plants, the Investor has engaged as a designer of technical documentation for part of those plants the company CBI Lummus from Brno, Czech Republic, which has considerable experience and knowledge when it comes to these types of facilities.

Delta Inženjering is engaged as a holder of technical documentation. Its team of designers has adjusted the documentation of CBI Lummus with local regulations and prepared additional calculations and projects.

RAFINERIJA NAFTE BEOGRAD

OIL REFINERY BEOGRAD

Jedan od partnera bila je Rafinerija nafte Beograd.

Naša saradnja odvijala se na različitim nivoima:

- rekonstrukcija i osposobljavanje postrojenja za prečišćavanje zauljenih otpadnih voda;
- ispitivanja sudova pod pritiskom i skladišnih rezervoara;
- adaptacija skladišta bačvi, površine 2.700 m^2;
- projektovanje i izvođenje internih saobraćajnica, površine 13.000 m^2.

One of the partners was the Oil Refinery Beograd.

Our cooperation was carried out at different levels:

- reconstruction of the plant and enabling it for the oily wastewater treatment;
- examination and testing of pressure vessels and storage tanks;
- adaptation of the barrel storage, size 2700 m^2;
- designing and construction of internal roadways, size 13000 m^2.

RAFINERIJA NAFTE BROD

Cilj koji je investitor postavio pre ugovaranja je da se obezbedi vraćanje 97-100% kondenzata, što bi kao posledicu trebalo da ima direktne uštede, odnosno smanjenje potrošnje mazuta koji se troši za proizvodnju pare.

Radovi su izvedeni tokom remonta rafinerije, a sistem je pušten u rad u decembru 2010. godine. Tehnička rešenja koja su data u projektu su se pokazala kao ispravna, i prema dosadašnjem praćenju rada sistema vraća se 100% kondenzata.

U najkraćim crtama, projektom je obuhvaćeno sledeće:

1. Sanirana su sva curenja na linijama pare
2. Postavljeni su odvajači kondenzata na mestima gde nedostaju
3. Postojeći odvajači kondenzata zamenjeni su novim, pravilno odabranim i ispravnim odvajačima
4. Isprojektovan je nov sistem za prikupljanje i povratak kondenzata koji je omogućio vraćanje celokupne količine kondenzata
5. Tehničkim rešenjima koja su data u elektroprojektu omogućeno je da 317 instrumenata pređe sa grejanja parom na grejanje električnom energijom.

Svi navedeni radovi su omogućili da se smanji ukupna potrošnja pare u procesu, a time i sopstvena potrošnja pare u energani.

OIL REFINERY BROD

The objective that the Investor set before signing the contract is to ensure return of 97-100% of condensate, what as a result should have direct savings and the reduction in consumption of fuel oil, which is spent to produce steam.

The works were carried out during a refinery outage, and the system was put into operation in December 2010. Technical solutions which were given in the project proved to be correct, and according to the current monitoring system operation it returns 100% of condensate.

In short, the project included the following:

1. All the leaks in steam lines were repaired
2. Steam traps were mounted in places where missing
3. The existing steam traps were replaced with the new, properly selected and accurate traps
4. A new system for the collection and return of condensate was designed, which enabled the return of the entire amount of condensate
5. With technical solutions, which were given in the electrical project, 317 instruments were enabled to switch from the steam heating to electricity.

All these works were made possible to reduce overall consumption of steam in the process, and thus the power consumption of steam in the power plant.

PODZEMNO SKLADIŠTE GASA BANATSKI DVOR

Delta Inženjering je za naručioca Srbijagas u podzemnom skladištu gasa u Banatskom Dvoru izveo građevinske radove, elektroenergetsko napajanje i instaliranje merno-regulacione opreme na izgradnji novog postrojenja - linija za proizvodnju gasa.

U građevinskom smislu, izvršena je izrada novih objekata:

- Primarni objekti postrojenja za smeštaj mašinske i elektroopreme
- Temelji zasebne mašinske opreme
- Objekti za potrebe povezivanja postojećeg i novog postrojenja
- Infrastrukturni objekti – instalacije, hidro-građevinski objekti i objekti niskogradnje

U smislu merenja i regulacije novog dela postrojenja, primenjeno je tehničko rešenje koje, uz primenu savremene merno-regulacione opreme i tehnike, omogućava daljinski nadzor i upravljanje procesom odstranjivanja tečnosti iz gasa u režimu proizvodnje. Takođe su implementirana potrebna proširenja sistema za nadzor i upravljanje za celu liniju proizvodnje, kako na upravljačkom tako i na nadzornom nivou.

UNDERGROUND GAS WAREHOUSE IN BANATSKI DVOR

Delta Inženjering has executed construction works for the client Srbijagas on the project of Underground Gas Warehouse at Banatski Dvor, including civil construction, electric power supply and installation of control and measuring equipment within the construction of the new plant – Gas Production Line.

Within those activities have been built the following new plants and facilities:

- Primary facilities of the plant for housing of mechanical and electrical equipment
- Foundations for separate mechanical equipment
- Structures required for connection of the existing and new plant
- Infrastructure facilities – installations, hydro-construction facilities and civil engineering facilities

In terms of the measurement and regulation of the new part of the plant, the technical solution have been applied which, with the application of modern measurement and regulation equipment and technique, enables remote supervision and control of the liquid from gas elimination process in the production mode. Likewise have been implemented necesery widening of the supervision and control system for the whole production line, both on control and supervision level.

KOLUBARA

Pošavši od činjenice da se od ukupno proizvedene električne energije 62% proizvede u TENT Obrenovac sagorevanjem kolubarskog uglja, jasno je da se energetska stabilnost Republike Srbije može održati samo dobrim funkcionisanjem Rudarskog bazena Kolubara. Da bi se to ostvarilo, bilo je potrebno konstantno prisustvo u kolubarskom basenu i naših stručnjaka, i to onih koji su sada u Delta Inženjeringu.

Pored rudarskih stručnjaka investitora, tokom svih ovih godina smo kreirali i projektovali tehnološke komplekse i složene uređaje koji su sada u ekspolataciji. Različiti zahtevi koje je definisao investitor o usavršavanju postojećih rešenja i otklanjanju uskog grla uspešno su i ažurno rešavani.

Starting from the fact that 62% from total generated electricity is generated in the thermal power plant (TENT) Obrenovac by burning coal from the open pits in Kolubara, it is clear that the energy stability of the Republic of Serbia can be sustained only by a good functioning of the Kolubara Mining Basin. To achieve this goal, it was necessary to have a constant presence of domestic experts at the Kolubara Mining Basin, those who are now in Delta Inženjering.

Along with the Investor's experts in mining, in the course of all these years we have been creating and designing technological complexes and complex devices which are now in use. Various requirements defined by the Investor on perfecting of the existing design solutions and removal of bottle-neck have been successfully and timely resolved.

TERMOELEKTRANA NIKOLA TESLA (TENT B)

Sistem za kontrolu kvaliteta i kvantiteta uglja

THERMAL POWER PLANT NIKOLA TESLA (TENT B)

System for Quality and Quantity Control of Coal

Projekat kontrole kvaliteta i količine primljenog uglja

Cilj ovog projekta je da se, adaptacijom transportera T2 (traka T2R i T2L) na dopremi uglja, reši pitanje kontrole kvaliteta i količina dopremljenog uglja u TENT B. Odabrani su Delta Inženjering, koji je izradio glavni projekat i izveo radove za izgradnju postrojenja sistema za uzorkovanje uglja i SGS, kompanija koja se bavi kontrolom kvaliteta i koja je isporučilac opreme i nosilac projekta.

- Jedinstveni sistem ove vrste u Srbiji i regionu.
- Sistem objedinjuje četiri podsistemske celine, koje za cilj imaju da se dobije egzaktna informacija o kvalitetu i kvantitetu uglja u realnom vremenu bez prostora za aproksimacije. Parametri kvaliteta uglja koje ovaj sistem meri su: vlaga, toplotna moć, sadržaj sumpora i pepela.
- Sistem takođe omogućava praćenje kvaliteta uglja po slojevima u svakom prihvatnom bunkeru. To omogućava da se u realnom vremenu zna kakav se kvalitet isporučuje na kotlove, što omogućava bolje planiranje, podizanje energetske efikasnosti i bolje pogonske spremnosti bloka. Podaci sa ovog sistema omogućiće podatke za efikasniju izradu energetskog bilansa i proračun specifične potrošnje bloka, a pomoći će u predviđanju uticaja rada TE i na životnu sredinu.

Project for quality and quantity control of received coal

The aim of this project is to resolve the issue of quality and quantity of delivered coal to TENT B by adaptation of the belt conveyor T2 (beltT2R andT2L) for coal delivering. Delta Inženjering has developed a main project and constructed the plant of system for coal sampling and SGS, the company dealing with quality control, which was the equipment supplier and the project owner.

- The unique system of its kind in Serbia and the region.
- The system includes four sub-system parts, which aim is to obtain exact information on the quality and quantity of coal in real time with no room for approximation. Quality parameters of coal this system measures are: moisture, heat and power, sulfur and ash content.
- The system also allows monitoring of the quality of coal by layers in each reception bunker. This allows to be known in a real time what kind of the quality is delivered to the boilers, which allows better planning, improving energy efficiency and better operational readiness of the block. Data from this system will provide data for making more efficient the energy balance and calculation of specific energy blocks, and will help in forecasting the impact of thermal power plant operations and on the environment.

ŽELEZARA SMEDEREVO

Za potrebe Železare Smederevo (U.S. Steel), Delta Inženjering je izveo glavni i izvođački projekat postrojenja za sekundarno otprašivanje konvertorskog i mikserskog odeljenja čeličane.

U ova dva odeljenja odvijaju se tehnološki procesi proizvodnje čelika pri kojima se emituje znatna količina prašine i produkata sagorevanja koje je potrebno na odgovarajući način prikupiti, a zatim filtriranjem izdvojiti iz vazduha.

Sistem sekundarnog otprašivanja, čije je izvođenje u toku, treba da zadrži više od 95% dimnih gasova koji se oslobađaju tokom proizvodnje, tako da smederevska čeličana postaje deo ekološki prihvatljivog procesa proizvodnje čelika.

For the Železara Smederevo (U.S. Steel), Delta Inženjering has prepared a main design and construction documentation for the secondary dedusting plant at the converter and mixer room in the Ironworks.

The technological processes of steel production are taking place in these two rooms during which is emitted a considerable amount of dust and combustion products, which need to be properly collected and then extracted from the air by filtration.

Secondary dedusting system, which construction is in the progress, should hold more than 95% of the flue gases that are released during the production of steel so the Ironworks Smederevo could become part of the environmental process of a steel production.

HENKEL

Uporedo sa dugogodišnjim prisustvom u fabrici Henkel Merima u Kruševcu, gde smo učestvovali kao projektanti i izvođači u nizu izgradnji i adaptacija postojećih kapaciteta, pojavili smo se 2006. u novoj ulozi generalnog izvođača radova na realizaciji nove Henkelove fabrike građevinskih adheziva u Inđiji i označili istovremeno i početak izgradnje ove industrijske zone.

U 2008. godini izvršeno je proširenje kapaciteta postrojenja Fazom 2, projektovanjem i izvođenjem postrojenja za proizvodnju tečnih proizvoda *WET production*.

Dugogodišnja saradnja Henkela i Delta Inženjeringa nastavljena je i na projektu top filtera u kruševačkom pogonu. Delta Inženjering je imao ulogu generalnog izvođača radova, dok se filter izrađuje u našim pogonima po podlogama nemačke firme Mikropul, isporučioca filtera.

Parallel to our long time presence at Henkel Merima in Kruševac, where we have participated as a designer and contractor on the new buildings and during adaptation of the existing capacities, in the year 2006 we acted as a general consultant and contractor on the construction of a new Henkel Adhesives Factory in Inđija, which marked at the same time the beginning of this industrial zone development.

In the course of 2008 we conducted the expansion of the plant capacities by the Phase 2, designing and constructing of the plant for the production of liquid products WET Production.

A long-time cooperation between Henkel and Delta Inženjering has continued on the top filter project in the Kruševac plant. Delta Inženjering acted as a general contractor of work, and the filter was manufactured in our plants according to design data of supplier, the German company Mikropul.

FABRIKA SLADOLEDA NESTLE

Izgradnja fabrike Delta sladoled (današnja Nestle) u Staroj Pazovi u periodu od 1997. do1998. godine predstavlja prekretnicu u razvoju Delta Inženjeringa. Projektantski tim Delta Inženjeringa od dvadesetak ljudi uspeo je da razradi ideju grčkog investitora i realizuje idejne i glavne projekte tog kompleksnog postrojenja, a nakon toga da pogone i izgradi.

Od zapuštenih prostora bivšeg auto-servisa napravljena je savremena fabrika za proizvodnju i skladištenje sladoleda, danas u vlasništvu kompanije Nestlé. Neophodnost koordinirane organizacije rada u projektnom birou i na gradilištu, koja je rezultirala uspešnim završetkom posla, pokazala je da smo dovoljno porasli da ugovaramo poslove po sistemu ključ u ruke. Ovaj objekat otvorio je vrata poslovima koji su usledili.

ICE CREAM FACTORY NESTLE

Construction of Delta Ice-Cream Factory (now days Nestle) in Stara Pazova during period from 1997 to 1998 is a milestone in the development of Delta Inženjering. Delta Inženjering design team was able to develop the idea of Greek investor, to prepare preliminary and main designs of this complex plant and to construct those facilities.

A modern factory for the production and storage of ice-cream, now owned by Nestlé, was made from the abandoned spaces of the former car service. Necessity of coordinated organization of work in the design office and on the site, which resulted in the successful completion of the work, showed that we are big enough to contract on a turn-key basis. This facility has opened the door for new jobs that followed.

HUSQVARNA

Sa površinom od 1800m² regalno-skladišnog prostora i oko 1600m² administrativno-upravnog i servisnog prostora, objekat distributivno-servisnog centra švedskog proizvođača alata predstavlja ekonomično i funkcionalno projektovanu gradjevinsku strukturu.

Tim Delta Inženjeringa je u realizaciji ovog posla imao trostruku ulogu: projektnog menadžera, projektanta i generalnog izvođača radova.

With the area of 1800 m² shelving and storage space, and about 1600 m² office and service space, the distributive-service center facility of the Swedish tool producer Husquarna in Stara Pazova represents an economically and functionally designed building structure.

In the realization of this project, the team of Delta Inženjering was entrusted with a triple role: project manager, project designer and general contractor.

ALUMIL

Godine 2003, u vreme kada su strane investicije bile tek u začetku, poznati grčki proizvođač aluminijumskih profila Alumil – Milonas S.A. odabrao je Delta Inženjering za partnera u Srbiji.

Ugovoreni posao je označio našu kompaniju kao generalnog projektanta prve fabrike Alumil YU Industry u industrijskoj zoni u Novoj Pazovi, površine preko 10.000m². Ubrzo po završetku glavnih projekata postali smo i generalni izvođač radova na izgradnji fabrike.

Uporedo sa izgradnjom kompleksa Alumil YU Industry završavali smo projekte za drugu fabriku Alumil Coating Srb na susednoj parceli, površine preko 7.000m². Nova proizvodna hala je izgrađena odmah nakon prve.

Saradnja je nastavljena i u 2012. Isprojektovan je i izgrađen novi pogon za ekstruziju aluminijumskih profila.

In 2003, when foreign investments were at the initial stage, the renowned Greek manufacturer of aluminium profiles Alumil – Milonas S.A. chose Delta Inženjering for its partner in Serbia.

The contracted work marked our company as a general designer of the first Alumil YU Industry Factory in the industrial zone in Nova Pazova, total area over 10000 m². Soon after the completion of the final designs, we became a general contractor on the factory construction.

Parallel with the construction of the aluminum profile complex Alumil YU Industry, we were finalizing designs for the second facility Alumil Coating Srb for the treatment and coating of profiles, covering the area of 7000 m² at the adjacent site. The new production hall was built immediately after the first one.

Cooperation continued in 2012. A new plant for extrusion of aluminum profiles was designed and constructed.

VOLVO

Nastavljajući niz uspešnih projekata, Delta Inženjering je u 2007. godini počeo izgradnju servisno-prodajnog centra za kamione Volvo u Novim Banovcima.

Sa čuvenim švedskim investitorom ugovorena je prvo izrada svih projekata, a kasnije i kompletno izvođenje radova na kompleksu veličine 3 ha, sa objektom površine 3.100 m². Volvo centar pušten je u rad u martu 2008. godine.

In continuation of the successful projects, Delta Inženjering started construction of the service and distributive center for Volvo trucks in Novi Banovci in 2007.

The well-known Swedish investor first contracted complete design work and later the execution of works at the site of 3 ha, with the facility covering an area of 3100 m². The Volvo Center was put into operation in March 2008.

HOLCIM

U okviru niza aktivnosti sa ciljem modernizacije i povećanja kapaciteta postrojenja za proizvodnju klinkera učestvovali smo u velikom broju projekata za potrebe kompanije Holcim čija izrada podrazumeva poštovanje svih pravila i propisa Republike Srbije i EU, a koji se naročito odnose na zaštitu životne sredine.

Rešavanje problema zagađenog vazduha, naročito u fabrikama cementa, predstavlja pravi izazov.

Kao jedna od mera zaštite životne sredine predvidjaju se sistemi za otprašivanje i filtriranje vazduha pre njegovog ispuštanja u atmosferu. Stručnjaci Delta Inženjeringa svoje iskustvo u borbi sa ovim problemom uspešno primenjuju već godinama na mnogobrojnim postrojenjima u okviru cementare. Obuhvaćeni su mlin sirovina, mlinovi cementa, postrojenja za pakovanje cementa, postrojenja za sagorevanje sekundarnih sirovina, postrojenje za sušenje pepela, doziranje pepela i praha.

Projektantski tim Delta Inženjeringa je uradio veliki deo projekata, a za montažu čelične konstrukcije bio je odgovoran tim Alfa Monta. O veličini ovih poslova, a to su zgrada aditiva, transportni mostovi klinkera, pretovarna kula, rekonstrukcija zgrade aditiva, dovoljno govori podatak da je ukupno izvedeno i montirano oko 1200 t čelika.

Drugi važan aspekt zaštite životne sredine jeste zaštita voda.
U proteklom periodu izgradili smo dva postrojenja za prečišćavanje otpadnih voda u okviru cementare Holcim:

- Postrojenje za prečišćavanje otpadnih voda sa dela fabrike Polysius, sa ispustom prečišćenog efluenta u potok Toplik, kapaciteta 4 l/sec
- Postrojenje za prečišćavanje otpadnih voda sa dela fabrike FLS, sa ispustom prečišćenog efluenta u reku Crnicu, kapaciteta 20 l/sec

Prvo postrojenje je u eksploataciji dve godine, dok je drugo pušteno u rad u novembru 2008. godine. Na oba postrojenja prečišćavaju se zbirne otpadne vode (zagađene atmosferske i sanitarno-fekalne otpadne vode).

Within numerous activities aimed at carrying out modernization and increasing of the clinker plant capacity, we have participated on a great number of projects for the requirements of the company Holcim which production involves compliance with all rules and regulations of Republic of Serbia and EU, which are particularly related to environmental protection.

As one of the environmental protection measures are planned dedusting systems and systems for air filtration prior to its release into the atmosphere.

For many years experts of Delta Inženjering have been implementing their experience in fighting this problem successfully on a number of plants within the Cement Factory. They covered in their work the raw mill, cement mills, cement packing plants, secondary raw material burning plants, ash drying plants, ash and powder feed plant. Many designs required for these projects were developed by the team of Delta Inženjering's design engineers and for the erection of steel structures was responsible Alfa Mont.

The extent of these projects, which include the additives building, clinker conveyer bridges, transshipment tower and the reconstruction of the additives building, can be demonstrated by the fact that 1200t of steel was constructed and erected.

The second important aspect of environmental control is water protection. In recent years, we have built two wastewater treatment plants within the Holcim Cement Factory:

- Wastewater Treatment Plant with the discharge of treated effluent into the Toplik stream, capacity 4 l/sec
- Wastewater Treatment Plant with the discharge into the Crnica river, capacity 20l/sec

The first plant has been in operation for two years, while the second plant was put into operation in November 2008. Collective wastewater is treated at both plants (polluted atmospheric and sanitary-sewage wastewater).

ARCELOR MITTAL Zenica

In 2012 Delta Inženjering completed all main designs for the dedusting system of a blast furnace casting platform and made operational whole system with capacity of 600,000 m^3 for the Investor Arcelor Mittal. The purpose of this system is to reduce emission of pollutants from technological processes, which are taking place in the Steel Factory Zenica.

Cooperation with the same investor was continued in the following year.
In 2013 Delta Inženjering completed design for the installation of hoods, which connect the main pipeline with the new filtration plant. Some hoods are movable due to easier maintenance.

Godine 2012. Delta Inženjering je za investitora Arcelor Mittal Zenica izradio sve glavne projekte sistema otprašivanja livne platforme visoke peći i pustio u rad ceo sistem sa kapacitetom od 600,000 m^3. Namena ovog sistema je da smanji emisiju otrovnih materija i čestica tokom tehnoloških procesa koji se odvijaju u Čeličani Zenica.

Saradnja sa istim investitorom se nastavila i sledeće godine. Delta inženjering je 2013. godine izradio projekat instalacije hauba, koje spajaju glavni cevovod sa novim filtracionim postrojenjem. Neke haube su pokretne radi lakšeg održavanja.

MONBAT PLC

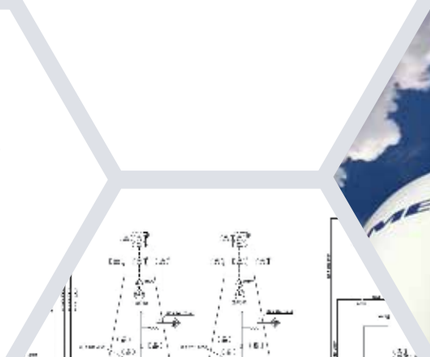
Fabrika za reciklažu starih akumulatora površine 20.000 m^2 u industrijskoj zoni Inđije predstavljala je složen zadatak za sve inženjerske struke. Generalni izvođač radova Delta Inženjering je angažovan i kao projektant pojedinih faza gradnje (glavni projekat trafo-stanice, glavni elektroprojekat kabliranja tehnološke opreme, glavni projekat kompresorskih stanica i razvoda komprimovanog vazduha, glavni projekat parne kotlarnice, itd).

The factory for recycling of old batteries with the surface of 20,000 m^2 in the industrial area of Inđija has been a very complex task to do in respect of all engineering branches.
The general contractor Delta Inženjering company was also engaged as a designer of the certain phases of construction (main design of a transformer station, main electrical design for cabling of a technological equipment, main design of the compressor stations and compressed air distribution, main design of a steam boiler room, etc).

MESSER

Na osnovu pozitivnih iskustava u 2007. godini na projektu postrojenja za razlaganje vazduha u Ribniku (Poljska), Messer Group iz Nemačke je početkom 2008. nastavio saradnju sa Delta Inženjeringom i poverio našoj kompaniji kompletno vođenje projekata fabrike za razlaganje vazduha (ASU - Air Separation Unit) u Dnjepropetrovsku (Ukrajina). Fabrika ima kapacitet proizvodnje 7.600 m^3/h gasovitih i oko 5.000 m^3/h tečnih tehničkih gasova.

Saradnja sa Messerom se nastavila do današnjih dana. Partnerski odnos preneli smo i na gradilište u Boru.



On the grounds of the positive experience on the project for the air separation in Rybnik (Poland) in 2007, Messer Group from Germany continued cooperation with Delta Inženjering in 2008 and entrusted to our company complete project management for the Air Separation Unit in Dnjepropetrovsk (Ukraine).
ASU - the Air Separation Unit in Dnepropetrovsk has the production capacity of gas oxygen 7,600 m^3/h and liquid technical gases 5,000 m^3/h.

Cooperation with Messer has continued to the present day. We have transferred our partnership to the site in the city of Bor.

IMG

Delta Inženjering je za potrebe velike italijanske grupacije Sol Group uradio kompletnu projektno-tehničku dokumentaciju i bio glavni izvođač radova u distributivnom centru gasova u Novoj Pazovi, gde se vrši punjenje, skladištenje i distribucija boca sa tehničkim gasovima.

For the requirements of the Italian group Sol Group, Delta Inženjering has developed the complete design and technical documentation and acted as a main contractor in the Distributive Gas Center – Nova Pazova, where is performed filling, storage and distribution of the bottles with technical gas.

3 POSLOVI U 2014. GODINI

PROJECTS IN 2014

HENKEL SRBIJA Kruševac	HENKEL SERBIA Kruševac
HENKEL Bileća	HENKEL Bileća
FIAT - Sprinkler sistem	FIAT - Sprinkler System
FIAT - Novo postrojenje za rashladno sredstvo HFO	FIAT - New Plant for Coolant HFO
BAMBI Požarevac	BAMBI Požarevac
RTB Bor	RTB Bor
MESSER Bor	MESSER Bor
PEZOS Export-Import Petrovaradin	PEZOS Export-Import Petrovaradin
PPOV Nikšić	WASTEWATER TREATMENT PLANT in Nikšić





HENKEL Srbija Kruševac

Predmet projekta je objekat SVR (Superior Value Rimblock) -Proizvodnja bref kuglica za negu i osvežavanje toaleta, kao i transportni most gotovih proizvoda od objekta SVR-a do centralnog magacina u okviru kompleksa fabrike za proizvodnju deterdženata, između fabrike tečnih deterdženata i magacina gotove robe.

Realizacijom projekta novog objekta za proizvodnju bref kuglica za negu i osvežavanje toaleta povećali su se proizvodni kapaciteta fabrike. Građevinski objekat izgrađen je u celosti, a postavljanje opreme se, u zavisnosti od potražnje na tržištu, izvodi u fazama.

Kroz dvofaznu izgradnju, u prvoj fazi su postavljene četiri linije za proizvodnju i tri linije za blister pakovanje. Kapacitet prve faze je 64 miliona kuglica godišnje. U drugoj fazi je predviđeno postavljanje još četiri linije za proizvodnju i još jedne linije završnog pakovanja. Kapacitet druge faze biće 40 miliona kuglica godišnje.

U kasnijoj fazi predviđena je ugradnja rezervnih miksera, transportera i jednog ekstrudera u svaku liniju, a za potrebe razvojnih poslova i da bi se izbegao zastoj proizvodnje pri kvaru i/ili remontu miksera. Ugradnja ove opreme ne povećava kapacitet proizvodnih linija, odnosno proizvodnog objekta-postrojenja, jer je kapacitet uslovljen opremom koja je iza ekstrudera u proizvodnom lancu.
Izbor opreme je vršio investitor, koji je ujedno i nosilac tehnologije.

U mostu za transport kutija sa gotovim proizvodom predviđeno je fazno postavljanje opreme. Maksimalni broj transportera u mostu je šest, i njihovo postavljanje direktno zavisi od broja linija za završno pakovanje. Svaka od linija ima svoj transporter, koji kutije sa gotovim proizvodom transportuje do mašine za paletiziranje.

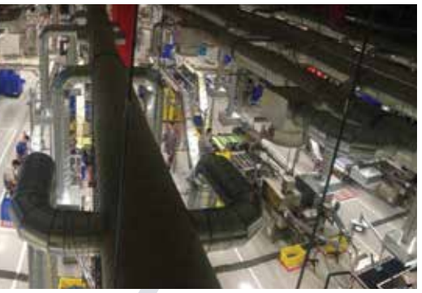
Tehnološkim projektom su obrađeni objekti (sekcije) za skladištenje praškastih sirovina, skladištenje ambalaže, proizvodnju i pakovanje bref kuglica za negu i osvežavanje toaleta, kao i transportnog sistema za transport gotovog proizvoda od sekcije za proizvodnju i pakovanje do skladišta gotovih proizvoda.

U skladištu praškastih sirovina montirani su regali za skladištenje najmanje 400 paleta dimenzija 1200x1000 mm, a u skladištu ambalaže regalno skladište za skladištenje najmanje 650 paleta dimenzija 1200x800 mm. Unutar skladišta praškastih sirovina izvedena je posebna prostorija za skladištenje texapona. U prostoriji za skladištenje texapona montirani su regali za skladištenje najmanje 15 paleta dimenzija 1200x800 mm.

Izvedena je i instalacija sledeće opreme:
Oprema za automatsko odmeravanje, pripremu i transport osnovnih praškastih sirovina, oprema za pripremu i odmeravanje ostalih praškastih sirovina, linija za proizvodnju kuglica (mikser, ekstruder, mašina za sečenje i oblikovanje kuglica), mašine za pakovanje kuglica u korpice, oprema za zbirno pakovanje (mašina za blister pakovanje i mašina za zatvaranje kutija), sistem za transport kutija i kompresorska stanica.

Svi radovi su izvršeni u skladu sa važećim propisima za ovu vrstu objekata i instalacija, kao i prema uputstvima eksperta za LEED sertifikaciju objekta.





HENKEL Serbia Kruševac

The subject of this project is the facility SVR – Production of Bref pellets for care and refreshing of toilets (SVR - Superior Value Rimblock), as well as a transport bridge of finished products from the facility SVR to the central warehouse within the complex factory for the production of detergents, between the factory of liquid detergents and finished goods warehouse.

By realization of a project for a new facility for the production of Bref pellets for care and refreshing of toilets has been increased the production capacity of the factory. The building is constructed in its entirety, and setting up of the equipment, depending on market demands, was carried out in stages.

Through the two-phase construction, in the first stage are set four lines for the production and three lines for a blister packing. The capacity of the first phase is 64 million pellets a year. In the second phase is planned the additional four lines for the production and another line for the final packaging. The capacity of the second phase will be 40 million balls a year.

At a later stage it is planned installation of spare mixers, conveyors and one extruder on each line, for the purposes of development activities and to avoid production slowdown during failure and/or repair of the mixer. Installation of this equipment does not increase the capacity of production lines, i.e. production facility or plant operations, because the capacity is determined by the equipment that is behind the extruder in the production chain. Equipment selection is performed by the Investor who is also the holder of technology.

On the transport bridge of boxes with finished product is planned the phased installation of the equipment. Maximum number of transporters in the bridge is six, and their placing is directly dependent on the number of lines for the final packaging. Each line has its own transporter, which transports boxes with the finished product to the machines for palletizing.

By a technology project are processed objects (sections) for storage of powdered raw materials, storage of wrapping material, production and packaging of Bref pellets for care and refreshing of toilets, as well as the transport system for transportation of finished products from the production and packaging section to the warehouse of finished products.

In the warehouse of powdery raw materials are mounted shelves for storage of minimum 400 pallets with dimensions 1200x1000 mm and in the wrapping material storage shelf warehouse for storage of minimum 650 pallets with dimensions 1200x800 mm. Inside the warehouse of powdery raw material is constructed a separate room for storage of Texapon. In the room for storage of Texapon are mounted shelves for storage of minimum 15 pallets with dimensions1200x800 mm.

The installation of following equipment is performed:
Equipment for automatic measurement, preparation and transport of basic powdery raw materials, equipment for preparation and measurement of other powdery raw materials, production lines for production of pellets (mixer, extruder, machine for cutting and shaping of pellets), machines for packing pellets in baskets, equipment for bulk packaging (machine for blister packing, machine for closing the boxes), system for boxes transportation and a compressor station.

All works are carried out in accordance with the applicable regulations for this type of facilities and installations, as well as according to the instructions of experts for LEED certification of the building.

HENKEL Bileća

U septembru 2014. godine Delta Inženjering je potpisao ugovor sa firmom Henkel o izgradnji fabrike građevinskih lepkova sa postrojenjem za mlevenje i separaciju kamena u Bileći, Republika Srpska.

Nakon što je Delta Inženjering izradio kompletnu projektnu dokumentaciju u periodu 2013-2014. godine, Henkel je ponovo izabrao Delta Inženjering, kao svog višegodišnjeg partnera na svim velikim investicijama u Srbiji a sada i u regionu, za generalnog izvođača radova po principu ključ u ruke i nosioca ovog višemilionskog posla.

Fabrički kompleks zauzima površinu od približno pet hektara, od toga je pod objektima preko 6.000 m^2, i gradi se u skladu sa najvišim tehničkim, tehnološkim i ekološkim standarima. Sastoji se od proizvodnih, skladišnih, administrativnih i pratećih objekata, elektro, hidro, termotehničkih instalacija, infrastrukture unutar kompleksa i pristupne saobraćajnice od magistralnog puta u dužini od oko 400 m, sa parkinzima za kamione i automobile.

Planirano je da nova fabrika bude završena do marta 2015. godine, i u njoj će se proizvoditi građevinski praškasti proizvodi na bazi cementa za polaganje keramičkih pločica, kao i proizvodi za termoizolaciju objekata, kojima će se snabdevati tržište BiH, Hrvatske, Crne Gore, Albanije.

In September 2014 Delta Inženjering signed a contrac twith Henkel for the construction of Adhesives Factory with a plant for grinding and separation of stone in Bileća, Republika Srpska.

After creating complete project documentation by Delta Inženjering in the period 2013-2014, Henkel re-elected Delta Inženjering, its perennial partner in all major investments in Serbia and now in the region, as a general contractor working on a turnkey base and someone who will be responsible for this multi-million deal.

The factory complex covers an area of about 5 ha, from which 6000 m^2 is under the buildings, and it is built in accordance with the highest technical, technological and environmental standards. It consists of manufacturing, storage, administrative and supporting facilities; electro, hydro and HVAC installation; infrastructure within complex and the access road from the main road in a length of about 400 m, with parking lots for trucks and cars.

It is planned for a new plant to be completed by March 2015, and in it will be manufactured constructional powder products based on cement for laying ceramic tiles, as well as products for thermal insulation of buildings, with which will be supplied markets of Bosnia and Herzegovina, Croatian, Montenegro and Albania.

FIAT AUTOMOBILI SRBIJA
Sprinkler sistem

Ove godine je takođe završena montaža stabilnog sistema za gašenje požara raspršenom vodom - sprinkler sistema u objektu montaže u okviru fabrike Fiat Automobili Srbija u Kragujevcu. Instalacija pokriva približno 50.000 m² proizvodnog prostora i smatra se jednim od najzahtevnijih izvođačkih poslova koji su izvedeni u FAS. Razlog je što se montaža odvijala samo vikendom, kada fabrika ne radi, i to sve na pozicijama pod krovom, na visini od 10-15 m, a iznad proizvodnih linija.

I pored teških uslova za rad, instalacija je izvedena vrlo profesionalno, uz pohvale kako konsultantske kuće Axa Matrix iz Italije, koja je pratila ceo projekat, tako i samog investitora - Fiat Automobili Srbija.

FIAT AUTOMOBILES SERBIA
Sprinkler System

This year was also completed installation of a stable fire extinguishing system with water spray - sprinkler system in the Assembly Shop within the factory Fiat Automobiles Serbia in Kragujevac. The installation covers approximately 50,000 m² of production space and is considered one of the most demanding execution tasks that are performed in FAS. The installation took place only on weekends when the factory was not working and all that on positions under the roof, at a height of 10-15 m and above the production lines.

Despite the difficult working conditions, the installation was finished very professionally with praise from consulting firm Axa Matrix from Italy, which monitored the whole project, and from the Investor - Fiat Automobiles Serbia.

Novo postrojenje za rashladno sredstvo HFO

Delta Inženjering je u toku 2014. godine uradio projekte i izveo postrojenje za skladištenje i distribuciju rashladnog sredstva HFO u fabrici automobila FAS u Kragujevcu.

S obzirom na to da se HFO skladišti pod pritiskom kao dvofazni fluid, a uz to je i zapaljiv, projektovanje, izgradnja i puštanje u rad postrojenja su predstavljali izazov. Tim pre što je ovo postrojenje, koje je izgrađeno u Kragujevcu, jedno od samo desetak sličnih postrojenja u Evropi, jer je u pitanju relativno nov fluid.

Naime, rashladno sredstvo HFO (odnosno r1234yf) će u skorijoj budućnosti zameniti freon R134a, koji se uobičajeno koristi u klima-uređajima automobila. Prednost HFO nad ranije korišćenim freonima je veoma mali indeks uticaja na globalno zagrevanje (Global Warming Potential), što ga čini ekološki prihvatljivom zamenom za postojeće freone.

FIAT je jedan od prvih proizvođača automobila koji je prihvatio HFO kao rashladno sredstvo za svoje automobile. Postrojenje se sastoji od pretakališta, skladišnog rezervoara, pneumatskih pumpi (Haskel), duplozidih cevovoda (Brugg) za transport fluida sa detekcijom curenja, armature (Valbia), mernih uređaja (Endress & Hauser, Veeder & Root), sistema za upravljanje (Siemens), sistema detekcije gasa (Honeywell) i drugih pomoćnih sistema.

New Plant for Coolant HFO

In 2014 Delta Inženjering prepared the projects and constructed the plant for storage and distribution of coolant HFO in the Car Factory FAS in Kragujevac.

Designing, constructing and commissioning of the plant represented a challenge since HFO is stored under a pressure as a two-phase fluid, and it's also flammable. The more so as this plant, which was built in Kragujevac, is one of a dozen similar plants in Europe, because it is a relatively new fluid. The coolant HFO (i.e. R1234yf) in the near future is going to replace Freon R134a, which is commonly used in the air-conditioned cars. HFO advantage over previously used Freon is very low index of the impact on global warming (Global Warming Potential), which makes it environmentally friendly substitute for existing CFCs.

FIAT was one of the first manufacturers which accepted HFO as a coolant for their cars. The plant consists of decanting facilities, storage tank, pneumatic pumps (Haskel), double wall pipelines (Brugg) for the transport of fluids with the detection of leaks, reinforcement bar (Valbia), measuring devices (Endress & Hauser, Veeder & Root), management system (Siemens), gas detection system (Honeywell) and other auxiliary systems.

BAMBI Požarevac

Lokacija i namena objekta

Proizvodni pogon predviđen za postavljanje nove tehnološko-proizvodne linije za proizvodnju i pakovanje plazma keksa nalazi se neposredno uz postojeći proizvodni objekat Bambi 2, u produžetku postojećeg aneksa B2, u fabričkom kompleksu pogona Bambi u industrijskoj zoni Požarevca.

Za potrebe smeštaja ambalaže, proširuje se postojeći objekat Bambi 2 prema platou između pogona Bambi 1 i Bambi 2.

Na spratu hale je predviđen prostor u kome će u jednom delu biti smeštena priprema sirovina, a u drugom tehnički prostori, kao što su mašinske sale za opremu klima sistema, elektro-prostor i prostor za otpad.

Funkcija i oblikovanje objekta

Arhitektonska koncepcija prilagođena je funkciji objekta i tehnološkim zahtevima.

Objekat je zbog zahteva tehnologije proizvodnje koja se u njemu odvija podeljen prostor gde se odvija proizvodnja uz potrebne prateće prostorije.

Oprema za proizvodnju plazma keksa sastoji se od sledećih celina:

- Priprema, odmeravanje i doziranje sirovina;
- Linija za proizvodnju keksa;
- Linija za automatsko ulaganje keksa i primarno pakovanje (flopak);
- Mašina za sekundarno pakovanje – kartoniranje;
- Oprema za proizvodnju i pakovanje mlevenog keksa.

Instalacija

Projektovani objekti opremljeni su:

- Instalacijama vodovoda (sanitarna i protivpožarna mreža) i kanalizacije (fekalna i atmosferska);
- Elektroinstalacijama jake struje – rasveta;
- Telekomunikacionim i signalnim instalacijama;
- Termotehničkim instalacijama grejanja i ventilacije;
- Tehnološkim razvodom;
- Uzemljenjem i gromobranom.

U skladu sa protivpožarnim elaboratom, predvidjena je odgovarajuća protivpožarna zaštita objekta.

Veliki problem prilikom izvođenja bila je veza sa postojećim objektom Bambi 2 jer je tokom izgradnje proizvodnja keksa neprestalno radila. Sva dešavanja prilikom izvođenja morala su da se prilagode procesu proizvodnje. To se naročito odnosi na rušenja koja su se parcijalno dešavala, jer zbog neprestanog rada proizvodnje nije bilo moguće sve rušiti odjednom, kao i na samo povezivanje starog i novog objekta u dužini od cca 186 m.

Površine / Surfaces

Podela objekta po etažama	Division of the building by floors	Neto površina m² / Net surface m²	Bruto površina m² / Gross surface m²
Prizemlje-proizvodni pogon	Groung floor - Manufacturing Plant	**2.794,06**	**2.922,34**
Prvi sprat	First floor	**608,65**	**683,22**
Ukupna površina:	Total surface:	**3.402,71**	**3.605,56**

Location and Purpose of the Facility

The production facility planned for setting of a new technological production line for Plazma biscuits manufacturing and packaging is located next to the existing production facility Bambi 2, in the extension of the existing Annex B2, in the Bambi factory complex, in the industrial zone of Požarevac.

For the purposes of wrapping material storing, the existing facility Bambi 2 expands to the plateau between Bambi 1 and Bambi 2 facilities.

On the hall floor is planned a space in which will be preparation of raw materials and technical areas, such as mechanical halls for the air conditioning system's equipment, electrical space and space for waste.

Function and Design of the Facility

The architectural concept was adapted to the facility function and technological requirements. Due to demands of production technology that is going on, the facility is divided space, where production takes place, with the necessary ancillary facilities.

The equipment for the production of Plasma biscuits consists of following units:

- Prepare, weighing and dispensing of raw materials;
- Line for the production of biscuits;
- Line for biscuits automatic feeding and primary packaging (flopak);
- Machine for secondary packaging – cartoning;
- Equipment for production and packaging of ground biscuits.

Installation

Designed facilities are equipped with:

- Plumbing (sanitary and firefighting networks) and sanitation (sewerage and storm);
- Hight voltage electrical installations - lighting;
- Telecommunications and signaling installations;
- HVAC installations of heating and ventilation;
- Technological distribution;
- Grounding and lightning rod.

In accordance with the firefighting study, it is planned an adequate fire protection of the facility.

A big problem during the execution was the connection with the existing building Bambi 2 because production of biscuits was constantly working during the construction. All events during the execution have had to adapt to the production process. This is especially true for demolitions that have occurred partially, because of continuous operation of production it has not been possible to demolish all at once, as well as for connecting the old and the new object with a length of approximately 186 m.

RTB Bor

U RTB Bor u toku je realizacija projekta rekonstrukcije topionice bakra i dogradnje fabrike sumporne kiseline. Nova tehnologija topljenja u fleš peći predviđa upotrebu tehničkog kiseonika na peći i konvertorima, kao i upotrebu tehničkog azota na postrojenju za sušenje šarže.

Proizvodnja kiseonika i azota vršiće se u novoj fabrici kiseonika, koju firma Messer izgrađuje u neposrednoj blizini postojeće fabrike kiseonika, na lokaciji koja je vazdušno udaljena od topionice oko 450m.

U sadašnjim uslovima u topionici se koristi kiseonik samo za potrebe procesa topljenja na liniji 1. Na konvertorima se kiseonik ne koristi u dužem vremenskom periodu, mada je to predviđeno i postoji cevovod koji je izrađen za tu namenu. Postojeća linija 1 će biti u funkciji za sve vreme trajanja rekonstrukcije topionice i još godinu dana u punoj pripravnosti za rad nakon puštanja u rad nove topionice za slučaj dužih zastoja u periodu uhodavanja iste.

Firma Messer će kontinuirano isporučivati RTB-u odgovarajuće količine kiseonika i azota, zahtevanog kvaliteta, na granici isporuke GI1 koja se nalazi na granici između parcela RTB-a i Messer-a. Messer garantuje da će parametri i količine isporučenih gasova na granici isporuke GI1 biti takvi da obezbeđuju zahtevane količine i parametre istih na granicama GI2, GI3 i BL3.

Posao Delta Inženjeringa je izvodjenje gradjevinskih, mašinskih i elektroradova na razvodu kiseonika i azota od granice Messer - RTB Bor do topionice i konvertora 3 i 4. Radovi su bazirani na izradi i montaži noseće čelične konstrukcije, cevnom razvodu do mesta potrošnje i dovoda signala od fabrike kiseonika do komandne sobe topionice, kao i automatici za obogaćenje tehnološkog vazduha kiseonikom za potrebe konvertora 3 i 4.

In the RTB Bor is in progress realization of the project for reconstruction of Copper-Smelter Works and upgrading of Sulfuric Acid Factory. A new melting technology in the flash furnace provides the use of technical oxygen in the furnace and converters, as well as the use of technical nitrogen in the plant for batch drying.

Production of oxygen and nitrogen will be done in the new oxygen plant, which company Messer builds near the existing Oxygen Factory, in a location that is away from the Smelter Works around 450m by air.

In the current conditions in the Smelter Works oxygen is used only for the purposes of melting process on the line 1. On the converters oxygen is not used for a longer period of time, although it is planned and there is a pipeline that is created for this purpose. The existing line 1 will be in operation for all time during the reconstruction of Smelter Works and another year at full readiness for operation after the commissioning of the new Smelter Works in case of longer delays in the initial period of the same.

The company Messer will continuously deliver to RTB Bor adequate amounts of oxygen and nitrogen of the required quality at the delivery line GI1, which is located on the border between RTB Bor and Messer's sites. Messer guarantees that the parameters and the amount of gas delivered at delivery line GI1 will be such that provides quantity required and the same parameters on the borders GI2, GI3 and BL3.

Delta Inženjering's job is performing of construction, mechanical and electrical works on oxygen and natrium distribution from the border of Messer - RTB Bor to the Smelter Works and converters 3 and 4. The works are based on the fabrication and erection of steel structures, pipe distribution to the consumption place and signal feed from the Oxygen Factory to the control room in the Smelter Works as well as the automation technology for enrichment of technical air with oxygen for the needs of the converters 3 and 4.

MESSER Bor

Novo postrojenje za razlaganje vazduha ASU Bor 2 predstavlja posebnu proizvodnu celinu i sa postojećim postrojenjem ASU BOR 1 infrastukturno je povezano internom saobraćajnicom, sistemom hidrantske mreže, kišnom i tehnološkom kanalizacijom i korišćenjem određenih skladišnih kapaciteta postojećeg postrojenja - čelične sfere za skladištenje tečnog kiseonika, kapaciteta 500m^3. Novo postrojenje se izrađuje za potrebe snabdevanja nove topionice u RTB Bor tehničkim gasovima (O i N), koji se koriste za proces proizvodnje.

Posao Delta Inženjeringa je izrada glavnih projekata (arhitektonsko-građevinskog, mašinskog i elektroprojekta) za novo postrojenje ASU Bor 2. Nakon izrađenih glavnih projekata, naredni korak je izgradnja sledećih objekata i čelične konstrukcije:

1. Kompresorska hala za smeštaj opreme
2. Pumpna stanica sa pratećim bazenom za hladnu vodu
3. Cevni mostovi za oslanjanje cevovoda i cevne armature
4. Izrada svih potrebnih temelja za potrebnu opremu
5. Izrada prateće infrastukture za povezivanje starog i novog postrojenja

Nakon izvršenih građevinskih i elektroradova pristupa se mašinskim radovima koji se sastoje od:

1. Prefabrikacija i montaža cevnih linija na povezivanju opreme novog sistema
2. Montaža opreme koju isporučuje Messer Tehnogas
3. Izrada čelične konstrukcije za nošenje cevovoda
4. Izrada dokumentacije izvedenog stanja

Pored navedenih radova, Delta Inženjering je u svojstvu odgovornog izvođača radova na izradi Cold Box-a.

A new Air Separation Unit ASU Bor 2 represents a separate production unit and with the existing plant ASU BOR 1 is infrastructural connected by an internal road, hydrants network system, storm and technological sewer, and using certain storage capacities of the existing plant - steel spheres for storage of liquid oxygen with capacity of 500m^3. The new facility is made for the supplying purposes of a new melting house in RTB Bor with technical gases (O and N) used for the production process.

Delta Inženjering's job is a preparation of main designs (architectural and construction, mechanical and electrical) for a new plant ASU Bor 2. After the preparation of the main designs, the next step is the construction of the following facilities and steel structures:

1. Compressor hall for placing of the equipment
2. Pumping station with accompanying pool for cold water
3. Pipe bridges for supporting piping and fittings
4. Making all the necessary foundations for the necessary equipment
5. Development of supporting infrastructure to connect the old and new installations.

After the completion of construction and electrical works, it starts with mechanical works which is consist of:

1. Prefabrication and installation of pipeline for connecting the equipment to the new system
2. The installation of equipment supplied by Messer Tehnogas
3. Production of steel structures for pipeline carrying
4. Preparation of as-built documentation.

Besides mentioned works, Delta Inženjering is acting as a responsible contractor for Cold Box.

PEZOS Export-Import Petrovaradin

Nastavljajući niz uspešno projektovanih i izvedenih industrijskih kompleksa na teritoriji Vojvodine, Delta Inženjering je sklopio ugovor po sistemu ključ u ruke sa firmom Pezos za projektovanje i izgradnju skladišta cevi sa upravnom zgradom u Rumenki kod Novog Sada.
Našoj kompaniji je poverena izgradnja celog kompleksa.

Sa građenjem se počelo u junu 2014. Kako je naša obaveza i ishodovanje kompletne dokumentacije, od uslova za projektovanje, preko građevinske dozvole, pa sve do upotrebne dozvole, jedan od uslova koje smo dobili od nadležnih institucija je bilo i obavezno prisustvo arheološkog nadzora prilikom izvođenja svih zemljanih radova. Posle skidanja površinskog sloja humusa prosečne debljine 40cm, arheolozi su konstatovali da se na predmetnoj lokaciji nalaze pokretni i nepokretni arheološki nalazi – ostaci srednjevekovnog naselja iz perioda između 13-15 veka n.e. i uručeno nam je rešenje o privremenoj obustavi radova. Prema važećem zakonu o zaštiti kulturnih dobara investitora, on je dužan da obezbedi sve potrebne uslove i sredstva za zaštitu ugroženog arheološkog nasleđa, sredstva za istraživanje, zaštitu, čuvanje i publikovanje, što je naš investitor i učinio.

Arheološka iskopavanja su trajala sve do sredine oktobra, a Delta Inženjering je nastavio sa radovima 26.10.2014. Do kraja novembra meseca izvedeni su svi temelji, spoljne podzemne instalacije i kompletni zemljani radovi. Završetak svih radova je planiran za 01.03.2015.

Continuing the series of successfully designed and constructed industrial complexes in Vojvodina, Delta Inženjering has signed a contract on a turnkey base with the company Pezos for the design and construction of pipes warehouses with administrative building in Rumenka, near Novi Sad.
Our company is entrusted the construction of the entire complex.

The construction began in June 2014. As our obligation is to obtain complete documentation, from the designing requirements, through a construction permit, up to an occupancy permit, one of the conditions that we received from the competent authorities was the obligatory presence of archaeological supervision during the execution of all the earth works. After removing the surface layer of humus with average thickness of 40cm, the archaeologists concluded that on the site were movable and immovable archaeological finds - the remains of a medieval settlement from the period between 13-15 a.d. and a decision about temporary suspension of work was handed to us. According to the Law on the Protection of Cultural Property the Investor is obliged to provide all necessary conditions and resources for protection of the archeological heritage, funding for research, protection, preservation and publication, as our Investor did.

The archaeological excavations lasted until the middle of October, and Delta Inženjering continued to work till 26.10.2014 By the end of the month November all foundations were made, as well as external underground installations and complete earthworks. Completion of all works is planned for 01.03.2015.

PPOV Nikšić

Za potrebe izgradnje postrojenja za prečišćavanje otpadnih voda (PPOV) grada Nikšić, opština Nikšić je u maju 2011. godine potpisala ugovor sa španskim konzorcijumom Aqualia-Hidroterm, koji je dostavio najbolju ponudu za projektovanje i izgradnju postrojenja.

Finansijska sredstva opština Nikšić je obezbedila iz kreditnog aranžmana sa Evropskom investicionom bankom. Izgradnjom ovog postrojenja rešava se višedecenijski problem grada.

Na ovom izuzetno važnom projektu za grad Nikšić i Crnu Goru učestvovala je i naša firma Delta Inženjering, koja je sa španskom firmom Aqualia, generalnim izvođačem radova, sklopila dogovor početkom 2014. o izradi izvođačke projektne dokumentacije, kao i izradu i isporuku elektroupravljačkih ormana i celokupnog softvera za automatski rad i nadzor postrojenja (SCADA). Ovaj složeni sistem napajanja i upravljanja postrojenjem obuhvata 29 polja slobodnostojećih ormana elektromotornog pogona, sa preko 150 motornih potrošača, ukupne instalisane snage 1170kW. Projektovani i isporučeni ormani elektromotornog pogona su francuskog proizvođača Schneider Electric. Sistem za nadzor i upravljanje bazira se na opremi nemačkog proizvođača Siemens. Za osnovu sistema upravljanja, projektovana je moćna centralna procesorska jedinica CPU 414-3 PN/DP. Ulazno-izlazna konfiguracija je bazirana na distribuiranim ET200M I/O stanicama sa preko 1200 signala. Nadzor i upravljanje nad celokupnim sistemom je izvrešeno preko Siemens WINCC SCADA sistema.

Pored ovog dela projekta, Delta Inženjering je projektovao i isporučio opremu za automatsku detekciju i signalizaciju eksplozivnih i toksičnih gasova koji se javljaju u postrojenju.

WASTEWATER TREATMENT PLANT in Nikšić

In May 2011 for the purposes of building a Wastewater Treatment Plant (WWTP) for the city of Nikšić, the Nikšić municipality signed a contract with the Spanish consortium Aqualia-Hidroterm, which submitted the best bid for the design and construction of the plant.

The Nikšić municipality provided financial assets from the credit arrangement with the European Investment Bank. By the construction of this plant is solved a decades-old problem of the city.

On this very important project for the city of Nikšić and Montenegro was participated and our firm Delta Inženjering, which agreed development of the project documentation with the Spanish company Aqualia, a general contractor, as well as the creation and delivery of electrical control cabinets, entire software for automatically operation and monitoring system (SCADA) in early 2014. This complex system of supply and control unit includes 29 fields of free-standing cabinets of electrical drive with more than 150 motor customers with a total installed capacity of 1170kW. Designed and delivered electrical cabinets are from the French manufacturer Schneider Electric. The system for monitoring and control is based on the equipment of the German manufacturer Siemens. On the basis of the management system is designed powerful Central Processor Unit CPU 414-3 PN / DP. Input and output configuration is based on distributed stations ET200M I / O with over 1200 signals. Monitoring and control of the entire system was performed using Siemens WinCC SCADA system.

In addition to this design part, Delta Inženjering designed and delivered equipment for the automatic detection and signaling of explosive and toxic gases that occur in the plant.





4 ZAŠTITA ŽIVOTNE SREDINE

ENVIRONMENTAL PROTECTION

OTPRAŠIVANJE	DEDUSTING
HENKEL - TOP FILTER	HENKEL - TOP FILTER
HENKEL - LEED STANDARDIZACIJA	HENKEL - LEED CERTIFICATION
HOLCIM, Novi Popovac	HOLCIM, Novi Popovac
ŽELEZARA SMEDEREVO	ŽELEZARA SMEDEREVO
RAFINERIJA NAFTE PANČEVO	OIL REFINERY PANČEVO
TRETMAN VODA	WATER TREATMENT
NIS - Neutralizacija otpadnih voda iz HPV-a	NIS - Neutralization of wastewater from WTP
POSTROJENJE ZA RAZLAGANJE VAZDUHA, ASU (Air Separation Unit), Bor	AIR SEPARATION UNIT, ASU Bor
FIAT	FIAT
ŽELEZARA SMEDEREVO	ŽELEZARA SMEDEREVO
HOLCIM	HOLCIM
Rudnik i termoelektrana STANARI Postrojenje za pripremu vode za piće i vodosnabdevanje	Coal Mine and Thermal Power Plant STANARI Drinking Water Treatment and Water Supply Plant
PPOV Kraljevo - Generalni projekat postrojenja za prečišćavanje otpadnih voda grada Kraljeva	WWTP Kraljevo - General Design for the Wastewater Treatment Plant in the City of Kraljevo
PPOV Subotica	WWTP Subotica
PPOV Šabac - Tehnička kontrola glavnog projekta postrojenja za prečišćavanje otpadnih voda	WWTP Šabac - Technical Control of the Main Design for the Wastewater Treatment Plant in Šabac
PPOV Blace - Postrojenje za prečišćavnje sanitarno-fekalnih otpadnih voda	WWTP Blace **-** A treatment plant for sanitary-sewer wastewater in the municipality of Blace
PPOV Brus - Postrojenje za prečišćavnje sanitarno-fekalnih otpadnih voda	WWTP Brus - A treatment plant for sanitary-sewer wastewater in the municipality of Brus

TOP FILTER - HENKEL

U fabrici Henkel Merima u Kruševcu pušten je u pogon top filter, najsavremeniji ekološki sistem zaštite. Ugradnja top filtera je realizacija dugoročno planirane investicije kompanije Henkel u iznosu od milion evra.

Top filter, koji se ugrađuje na fabrički toranj, potpuno zadržava sve vrste vazdušnih čestica i mikročestica koje ostaju u vazduhu nakon procesa proizvodnje, tako da je vazduh koji se ispušta potpuno čist. Pored skoro stoprocentno pročišćenog vazduha koji se ispušta u atmosferu, top filter obezbeđuje i potpunu uštedu vode i smanjuje utrošak električne energije, koja je do sada trošena na ekološke sisteme zaštite, čime se sjedinjuju svi aspekti zaštite životne okoline i održivog razvoja.

U fabrici deterdženata Henkel Merima u Kruševcu ključno mesto u tehnološkom postupku proizvodnje deterdženata zauzima toranj AT 7101 (konvektivna sušara), u kome se obavlja proces sušenja poluproizvoda po principu raspršivanja tečne faze pod visokim pritiskom.

Delta Inženjering je, radi povećanja efikasnosti sistema prečišćavanja izlaznih gasova u procesu sušenja u tornju, izvršio adaptaciju kompletnog sistema prečišćavanja i prelazak na sistem suvog filtriranja izlaznog vazduha iz tornja. Ugrađen je filter na vrhu tornja koji prečišćava sav izlazni vazduh iz tornja za sušenje poluproizvoda. Kompenzacija termičkih dilatacija tornja i filtera rešena je postavljanjem kompenzatora ø6500 mm na prelazu između njih.

Ova koncepcija prečišćavanja izlaznog vazduha nije novina u Henkelovim pogonima za proizvodnju deterdženata, i kao takva proverena je u praksi i veoma je efikasna. Ugradnja ovakvog filtera značajno doprinosi očuvanju kvaliteta vazduha i ispunjava nove standarde postavljene Zakonom o zaštiti vazduha.

In 2009 was put into operation a top filter, the latest environmental protection system, in the factory Henkel Merima in Kruševac. Installation of the top filter is the realization of the planned long-term investment of Henkel in amount of one million euros.

The top filter, which is installed at the factory tower, fully retains all kinds of particles and micro-particles that remain in the air, after the production process, so that discharged air is completely clean. In addition to nearly one hundred percent purified air which is discharged into the atmosphere, the top filter provides complete water saving and reduces power consumption that has been spent on environmental protection systems, which unites all aspects of environmental protection and sustainable development.

A key role in the technological process of detergents production has a Tower AT 7101 (convective drier) that is used for the drying process of semi-manufactured goods on the principle of spraying liquid phase under high pressure.

To increase the efficiency of the outlet gas from the tower system purification, Delta Inženjering has renovated complete purification system of outlet air and transition to the dry filtering system of outlet air from the tower. The filter embed on the top of the tower cleans all outlet air from the tower for drying of semi-manufactured goods. Compensation of thermal dilatation of the tower and the filter is solved by placing the compensator ø6500 mm at the transition between them.

This conception of the outlet air purification is not new in Henkel's detergents production plants and as such was tested in practice and it is very effective. Installation of such filter significantly contributes to the preservation of air quality and meet the new standards set by the Law on Air Protection.

HENKEL

Fabrika za proizvodnju deterdženata, Kruševac

LEED STANDARDIZACIJA

Investitor se opredelio za to da Delta Inženjering objekat projektuje i gradi u skladu sa LEED zahtevima i tako konkuriše za dobijanje LEED sertifikata.

LEED je skraćenica za Leadership in Energy and Environmental Design i podrazumeva sistem za klasifikaciju prilikom projektovanja, izgradnje i upravljanja održivim gradilištima sa visokim performansama u pogledu energetske efikasnosti. LEED pruža sve neophodne instrumente da bismo dobili neposredno merljive procene rada gradilišta.

LEED promoviše procene performansi gradilišta u sledećim oblastima: održivi razvoj gradilišta, ušteda vode, energetska efikasnost, izbor materijala i resursa, kvalitet unutrašnjeg vazduha, inovacije u dizajnu, regionalni krediti.

LEED pomaže da se vaše gradilište transformiše i postane održivo vodeći računa o:

- Životnoj sredini
- Ekonomskom aspektu
- Dobrobiti okruženja u neposrednoj blizini gradilišta

HENKEL

Factory for Detergents Production

LEED CERTIFICATION

The Investor has choosen Delta Inženjering to design and construct the facility in accordance with LEED requirements and thus competes for LEED certification.

LEED stands for Leadership in Energy and Environmental Design and imply classification system during the design, construction and management of sustainable construction sites with high performances in terms of an energy efficiency. LEED provides all necessary tools in order to get directly measurable assessments of operations on the site.

LEED promotes sites performance evaluation in the following areas: sustainable site development, water saving, energy efficiency, materials and resource selection, indoor air quality, innovation in design and regional credits.

LEED helps to transform your building site and to become sustainable taking into account:

- Environment
- Economic aspects
- Benefits for the environment in the vicinity of the site

HOLCIM
Novi Popovac

U periodu jul-avgust 2004. godine Delta Inženjering je izradio projekat sistema otprašivanja linije za pakovanje sa vrećastim filterom za Holcim.
Izvršena je montaža vrećastog filtera sa radijalnim ventilatorom proizvođača Scheuch iz Austrije.

Cementna prašina, koja se izdvoji na filterskim vrećama, otresa se komprimovanim vazduhom, sakuplja u konusnom dnu filtera i pužnim transporterima i kanalima odvodi se u elevator i preko njega vraća u proces pakovanja cementa u vreće.

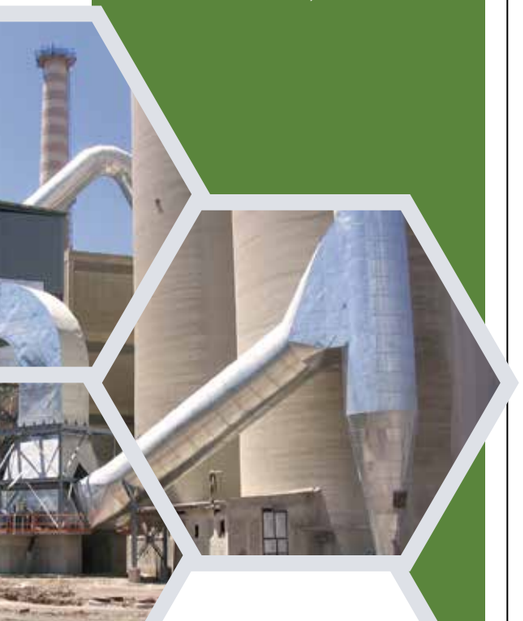
Vrećasti filter i ventilator su oprema nove generacije, sa vrlo visokim stepenom prečišćavanja zaprašenog vazduha. Koncentracija prašine u vazduhu koji se ispušta u atmosferu nakon filtriranja je 20 mg/m^3, što je u skladu sa Evropskim standardima.

Novi aspiracioni sistem za liniju pakovanja sa vrećastim filterom je omogućio najbolje moguće uslove radne i životne sredine, s obzirom na to da se radilo o vazduhu veoma ugroženom cementnom prašinom.

Uspešno obavljeni poslovi na projektovanju u oblasti otprašivanja u cementnoj industriji u 2004. godini otvorili su vrata Delta Inženjeringu za nove projekte otprašivanja, kao što su:

- Rekonstrukcija i dogradnja zgrade pakovanja sa dve linije pakovanja cementa u vreće i sistemom otprašivanja cementare Holcim u N.Popovcu;
- Otprašivanje u fabrici deterdženata Henkel u Kruševcu;
- Otprašivanje konvektorskog i mikserskog odelenja čeličane U.S.Steel u Smederevu;
- Otprašivanje visoke peći u železari Arcelor Mittal u Zenici.

In July-August 2004 Delta Inženjering prepared design for the dedusting system of packaging line with a bag filter for Holcim. The bag filter with a radial fan, manufactured by Scheuch from Austria, was installed.



Cement dust, which is extracted on the filter bags, is shaken off by compressed air and is collected in the filter cone bottom and with the screw conveyors and chanels is drained away in elevator and through it back in the packaging process of cement in the bags.

The bag filter and fan are the new generation equipment, with a very high level of dust air purification. Dust concentration in the outlet air is 20 mg/m^3, which is in accordance with the European standards.

The new aspiration system for packaging line with a bag filter provides the best possible conditions and working environment, given that it is the highly degraded air by cement dust.

Well done design works in the field of cement industry in 2004 opened the door to Delta Inženjering for the new projects, such as:

- Reconstruction and expansion of the package building with two lines of cement packaging in bags and with dedusting system in the Cement Factory Holcim in N.Popovac;
- Dedusting system in the Detergent Factory Henkel in Kruševac;
- Dedusting of convector and mixer facility in the U.S.Steel Ironworks in Smederevo;
- Dedusting of the blast furnace no.4 in the Arcelor Mittal Ironworks in Zenica.

ŽELEZARA SMEDEREVO

U objektu čeličana u okviru Železare Smederevo odvijaju se tehnološki procesi prilikom kojih je dolazilo do velike emisije prašine i grafita. Izmerene vrednosti ovih emisija su prelazile zakonom propisane vrednosti, pa je pokrenut investicioni projekat čiji je cilj smanjenje emisije u mikserskom i konvertorskom odeljenju čeličane.

U miksersko odeljenje se dopremaju lonci sa tečnim gvožđem proizvedenim u visokim pećima. Pre ulivanja tečnog gvožđa u mikser, svi lonci moraju da prođu kroz postupak skidanja troske. U toku skidanja troske dolazilo je do velike emisije prašine i grafita. Procesi ulivanja i izlivanja tečnog gvožđa u/iz miksera su takođe bili izvori emisije prašine i grafita. Ovi procesi su bili pokriveni sistemom za otprašivanje koji nije bio u funkciji. U mikserskom odeljenju je zamenjen postojeći sistem i sistem za hvatanje struje dimnih gasova novim sistemom, koji je povezan na novi vrećasti filter.

Ponekad, kada uslovi proizvodnje to zahtevaju, nije moguće upotrebiti mikser za ulivanje tečnog gvožđa u ulivni lonac, već se obavlja tzv. prelivanje, odnosno direktan transfer tečnog gvožđa iz visokopećnog lonca u ulivni lonac pomoću jednog od mikserskih kranova. Ovaj proces nije bio pokriven sistemom za otprašivanje iako se prilikom ovog procesa javljala velika emisija prašine i grafita. Novi sistem otprašivanja je obuhvatio i ovaj proces, odnosno izvor prašine.

In the Steel Mill within the Železara Smederevo are taking place technological processes during which have come to very high emission of dust and graphite. The measured values of these emissions exceeded the legally prescribed values and therefore was initiated the investment project, which aim is to reduce emission in the mixer and converter facility of the Steel Mill.

In the mixer facility are delivered pots with liquid iron produced in a blast furnace. Before pouring liquid iron into the mixer, all the pots have to go through the process of slag removing. In the course of slag removing there were high emissions of dust and graphite. The processes of casting and pouring of liquid iron to/from the mixer were also sources of dust and graphite. These processes were covered by dedusting system, which was not operational. In the mixer facility the existing systems for capturing the flue gases has been replaced with the new one, which is connected to a new bag filter.

Sometimes, when the production conditions requires it, it is not possible to use the mixer for liquid iron inflowing in the pouring pot but to perform so-called overflow, i.e. direct transfer of liquid iron from the blast furnace pot into pouring pot, using one of the mixer crane. This process was not covered by dedusting system although during this process has occurred large dust and graphite emission. The new dedusting system has covered this process, i.e. source of dust.

RAFINERIJA NAFTE PANČEVO

U okviru projekta adaptacije pretakališta TNG-a (tečnog naftnog gasa) realizovaće se modernizacija vanprocesnih postrojenja uvođenjem nove tehnologije merenja pri dopremi i otpremi na auto i železničkom pretakalištu TNG-a, s obzirom na to da postojeće auto i železničko pretakalište ne pruža potrebnu efikasnost, tačnost i sigurnost u skladu sa važećim zakonima, tehničkim propisima i propisima za zaštitu životne sredine.

Cilj i svrha ovog projekta je integrisano, moderno, pouzdano, ekološki prihvatljivo, precizno i centralizovano upravljanje i nazor nad instalacijama na pretakalištu TNG-a u NIS-RNP, uz primenu metroloških uslova i propisa Republike Srbije za obračunsko merenje.

Izvođenje radova je povereno isključivo članicama Delta grupe.

OIL REFINERY PANČEVO

In the framework of the adaptation design for decanting facilities of LPG (Liquefied Petroleum Gas) will be carried out modernization of non procedural plants by introducing a new measurement technology during delivery and dispatch at the car and railway decanting of LPG, given that the existing car and railway decanting facilities does not provide the required efficiency, accuracy and security in accordance with applicable laws, technical regulations and rules for the environment protection.

The aim and purpose of this project is an integrated, modern, reliable, environmentally friendly, accurate and centralized management and control of installations at the decanting facilities of LPG in NIS-RNP, with the application of metrological conditions and regulations in the Republic of Serbia for accounting measurement.

Execution of works has been entrusted exclusively to the members of Delta Group.

U sklopu realizacije novih postrojenja (MHC-DHT, HGU, SARU), na kojima se obavlja proizvodnja derivata evropskog kvaliteta, Delta Inženjering je isprojektovao, izgradio i pustio u rad novi sistem za obezbeđenje demineralizovane, demi vode i neutralizaciju kiselo-baznih otpadnih voda koje nastaju regeneracijom katjonske i anjonske linije za proizvodnju demi vode, sa izgradnjom novih rezervoara u kojima se odvija proces neutralizacije otpadnih voda.

Demineralizovana, demi voda se proizvodi unutar postrojenja za hemijsku pripremu postupkom jonske izmene i filtracijom na filterima sa mešanom ispunom. Osim rekonstrukcije i izgradnje nove linije cevovoda, projektom je predviđeno da se skladišna zapremina za demi vodu proširi za 500m^3 kako bi se obezbedilo kontinualno i pouzdano snadbevanje novih potrošača. Ovo proširenje je ostvareno izgradnjom dva nova čelična rezervoara FB-9331 i FB-9332, pri čemu svaki rezervoar ima zapreminu od 250m^3. Rezervoari su opremljeni svim potrebnim procesnim priključcima, kao i priključcima za predviđene instrumente.

NEUTRALIZACIJA OTPADNIH VODA IZ HPV-A

NIS - Rafinerija nafte Pančevo

NEUTRALIZATION OF WASTEWATER FROM WTP

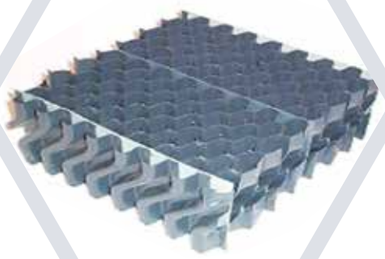
NIS – Oil Refinery Pančevo

Within the implementation of the new plants (MHC-DHT, HGU, SARU), which are used for manufacturing of European quality derivatives, Delta Inženjering has designed, engineered and commissioned a new system for supply of demineralized water and neutralization of acid and alkali wastewater that originates from regeneration of cation and anion production lines of demi water, with the construction of the new reaction tanks for the process of wastewater neutralization.

Demineralized water is produced within the water preparation plant by ion exchange process and filtrations on mixed bag filters. Besides the reconstruction and installation of a new pipe line, by the project is planned the expansion of storage for demi water by 500m^3 to ensure continuous and reliable supply of the new plants. This expansion is achieved by building two new steel tanks FB-9331 and FB-9332. Each tank has a capacity of 250m^3. The tanks are equipped with all necessary process connections as well as connections for belonging instruments.

POSTROJENJE ZA RAZLAGANJE VAZDUHA, ASU (Air Separation Unit) Bor

U okviru projekta novog postrojenja za razlaganje vazduha – ASU Bor, koji za potrebe Messer-Tehnogasa projektuje Delta Inženjering, Sektor za tretman voda je angažovan za projektovanje rashladnog sistema. U pitanju je zatvoreni recirkulacioni rashladni sistem kapaciteta 650m^3/h rashladne vode.



Osnovni delovi ovog rashladnog sistema su:

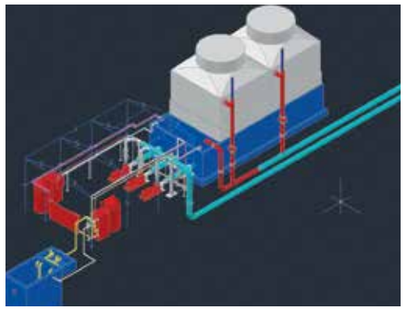
1. Pumpna stanica za rashladnu vodu: Unutar pumpne stanice smeštena je sva oprema potrebna za pravilno funkcionisanje rashladnog sistema. Srce celog sistema čine pumpe za rashladnu vodu. Projektom su predviđene dve radne i jedna rezervna horizontalna centrifugalna pumpa, proizvođača Allweiler.

Osim pumpi, unutar objekta nalaze se filter za rashladnu vodu kapaciteta 50 m^3/h, potpuno automatizovana dozirna stanica sa svom pripadajućom opremom i setom za merenje korozije unutar cevovoda, kao i filter za vodu za dopunu rashladnog sistema kapaciteta 50 m^3/h.

2. Rashladne kule sa bazenom za rashladnu vodu: Projektom je predviđena ugradnja dve rashladne kule dimenzija 4840x4840x5540mm, proizvođača SPX, na betonskom rezervoaru, sa prinudnom promajom, suprotnosmernim tokom i lamelnom ispunom.

3. Bazen za vodu za dopunu rashladnog sistema: Bazen je opremljen potopljenim centrifugalnim pumpama kapaciteta 50 m^3/h. Projektom je predviđena jedna radna i jedna rezervna pumpa. Sastavni deo bazena je i suvi šaht, u kome je smeštena sva potrebna cevovodna armatura.

AIR SEPARATION UNIT, ASU Bor



Within the project for the new Air Separation Unit - ASU Bor, which is designed by Delta Inženjering for Messer Tehnogas, Ecological and Water Treatment Sector inside Delta Inženjering has been involved in designing of the cooling system. It's a closed recirculating cooling system with a capacity of 650m^3/h cooling water.

The main parts of the cooling system are:

1. Pumping station for cooling water: Inside the pump station is located all the equipment needed for proper functioning of the cooling system. The heart of the whole system are the cooling water pumps. By the design are planned two operational and one spare horizontal centrifugal pump, manufactured by Allweiler.

Except the pumps, inside the building is a filter for cooling water with a capacity of 50 m^3/h, a fully automated dosing station with all accompanying equipment and equipment for measurement of corosion inside the pipe, as well as a water filter for additional water with capacity of 50 m^3/h.

2. Cooling towers with a pool of cooling water: By the design is planned installation of two cooling towers with the dimensions 4840x4840x5540mm, manufacturer SPX, on a concrete tank, with forced draft, counter current flow and lamella filling.

3. Water tank for recharge cooling system: The tank is equipped with two submersible centrifugal pumps, with a capacity of 50 m^3/h. By the design are planned one operational and one spare pump. An integral part of the tank is dry manhole in which are placed all necessary pipeline fittings.

FIAT

Izvršena je rekonstrukcija postrojenja za prečišćavanje otpadnih voda u pogonu Lakirnice i pogonu za farbanje branika. Bilo je neophodno da postojeće postrojenje za prečišćavanje otpadnih voda bude dodatno rekonstruisano, odnosno prilagođeno novim zahtevima buduće lakirnice, kao i budućeg pogona za farbanje branika u pogledu količine i kvaliteta tehnoloških otpadnih voda. Zbog toga su završene tri celine Katak I, II i III.

Prvom fazom rekonstrukcije (PPOV Katak I faza) postrojenje za prečišćavanje otpadnih voda prečišćava otpadnu vodu do nivoa kvaliteta potrebnog i dovoljnog za ispuštanje u gradski kanalizacioni sistem. Ukupna količina zbirnih diskontinualnih otpadnih voda na godišnjem nivou QD Uk=2.887,50 m^3/god.

Druga faza rekonstrukcije postrojenja (PPOV Katak II faza) omogućava prečišćavanje dva odvojena toka tehnološke otpadne vode, kao i obradu mulja. Predviđena ukupna količina zbirnih diskontinualnih otpadnih voda na godišnjem nivou QD Uk=15.441,20 m^3/god.

Koncept prečišćavanja tehnoloških otpadnih voda predviđen za treću fazu (Katak III) zasniva se na fizičko-hemijskom tretmanu tehnološke otpadne vode, uz proces uklanjanja ulja i masnoća. Očekivani (predviđeni) prosečni časovni protok je 42 m^3/h, dok maksimalni časovni protok (kapacitet) može biti 60 m^3/h.

A reconstruction of the plant for Wastewater Treatment Plant was performed in the Paint Shop and in the Bumper Paint Shop. It was essential that the existing Wastewater Treatment Plant be further reconstructed or adapted to the new demands of the future Paint Shop and the future Bumper Paint Shop, in terms of quality and quantity of process wastewater. Therefore three units have been completed, Katak I, II and III.

Within the first phase of reconstruction (WWTP Katak I phase) the Wastewater Treatment Plant purifies wastewater to the level of quality required and sufficient for discharge into the city sewer system. The total amount of discontinuous wastewater annually QDUk=2887.50 m^3/year.

The second phase of reconstruction (WWTP Katak II phase) enables treating of two separate flows of process wastewater and sludge. Planned total amount of discontinuous wastewater annually QDUk=15441.20 m^3/year.

The purification concept of process wastewater, scheduled for the third stage (Katak III), is based on the physical-chemical treatment of process wastewater with the process of removing oil and grease. Expected (estimated) average hourly flow rate is 42 m^3/h, while the maximum hourly flow rate (capacity) can be 60 m^3/h.

ŽELEZARA SMEDEREVO

Sistem kiseoničkih kopalja, odnosno konvertorskih duvnica, u pogonu čeličane omogućava dotok potrebne količine kiseonika za predviđene tehnološke procese u konvertorskom odeljenju železare u Smederevu.

U drugoj polovini 2011. godine Delta Inženjering je završio izvođenje zatvorenog rashladnog sistema, koji vrši hlađenje sistema kiseoničkih kopalja.

Sistemi hlađenja konvertorskih duvnica u pogonima svetskih železara su obično otvorenog, odnosno protočnog tipa, sa stalnom potrošnjom vode. Uspostavljanje recirkulacionog sistema je poboljšalo ekološku stranu fabrike u Smederevu i time smanjilo troškove za utrošenu vodu. Delta Inženjering uspešno je izveo zatvoreni rashladni sistem konvertorskih duvnica, koji je pušten u automatski rad.

Paralelno sa izvođenjem radova na zatvorenom rashladnom sistemu konvertorskih duvnica, Delta Inženjering je uspešno izvodio radove na drugom rashladnom postrojenju unutar pogona železare u Smederevu. Reč je o zatvorenom rashladnom sistemu unutar kompresorske stanice.

S obzirom na veoma teške uslove tokom izvođenja radova na rashladnom postrojenju, posebno tokom neprekidnog rada kompresorske stanice, izveden je svojevrstan podvig prevezivanja procesnog cevovoda velikog prečnika, kao i parcijalno puštanje rashladnog sistema u rad.

The system of oxygen lances or converter blowers in the steel mill plant provides supply of required amount of oxygen for planned technological processes in the converter department of the Ironworks in Smederevo.

In the second half of 2011, Delta Inženjering completed a closed cooling system, which cools the system of oxygen lances. The project is among difficult ones in terms of technical requirements on the location and very strict deadline for the cooling system construction.

The cooling system of converter blowers in the worldwide Ironworks are usually an open, i.e. circulating type with constant water consumption. Delta Inženjering successfully made the closed cooling system of converter blowers, which was automatically put into operation.

In parallel with the closed cooling system construction, Delta Inženjering successfully carried out works on the second cooling plant in the Ironworks in Smederevo. This is a closed cooling system inside the compressor station.

Given the very difficult conditions during operations in the cooling plant, especially during the continous running of the compressor station, we made the accomplishment of connecting pipelines with large diameter and partial commissioning of the cooling system.

HOLCIM

Projektovali smo i izgradili dva postrojenja za prečišćavanje otpadnih voda u okviru fabrike:

- Postrojenje za prečišćavanje otpadnih voda sa ispuštanjem prečišćenih otpadnih voda u potok Toplik, kapaciteta 4 l/sec;
- Postrojenje za prečišćavanje otpadnih voda sa ispuštanjem prečišćenih otpadnih voda u potok Crnica, kapaciteta 20 l/sec.

Zbirne otpadne vode prečišćavaju se u oba postrojenja (zagađene atmosferske i sanitarne vode).

We have designed and constructed two wastewater treatment plants within the Cement Factory Holcim:

- A Wastewater Treatment Plant with discharge of treated wastewater into the stream Toplik, with capacity of 4 l/sec;
- A Wastewater Treatment Plant with discharge of treated wastewater into the stream Crnica, with capacity of 20 l/sec.

Summary wastewater is treated in both plants (pollution of atmospheric and sanitary water).

Rudnik i termoelektrana STANARI

Postrojenje za pripremu vode za piće i vodosnabdevanje

Rudnik i termoelektrana Stanari, deo EFT grupe, 18. 05. 2013. godine položio je kamen-temeljac za izgradnju potpuno nove termoelektrane instalisane snage 300 MW u Stanarima, u Republici Srpskoj.

Angažovanje Delta Inženjeringa ogledalo se u izradi glavnog projekta za vodosnabdevenje i pripremu pijaće vode za gradilište termoelektrane ukupnog kapaciteta od 80 m^3/h i postrojenja za pripremu pijaće vode za upravnu zgradu i rudnik po sistemu ključ u ruke, kapaciteta 2 l/s.

Tretman vode u ovom slučaju se ogledao u redukciji gvožđa, mangana i amonijaka iz razloga primene bunarske vode kao napojne, čiji je sadržaj u vodi višestruko veći od vrednosti MDK, za gvožđe 3,27 mg/l (MDK=0,3 mg/l) i mangan 0,3 mg/l (MDK=0,05 mg/l).

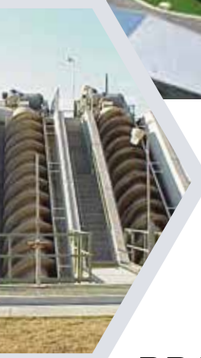
Coal Mine and Thermal Power Plant STANARI

Drinking Water Treatment and Water Supply Plant

18th May 2013 the coal mine and power plant Stanari, part of the EFT Group, laid the foundation stone for the construction of a brand new power plant with installed capacity of 300 MW in the city of Stanari, in Republika Srpska.

Engagement of Delta Inženjering was reflected in development of the main design for water supply and preparation of drinking water for the power plant construction site, with a total capacity of 80 m^3/h and a drinking water treatment plant for the administration building and the coal mine on a turnkey base with a capacity of 2 l/s.

Water treatment in this case was reflected in the reduction of iron, manganese and ammonium, which content in water is several times higher than Maximal Allowed Concentrations Values (MAC) for iron 3.27 mg/L (MAC = 0.3 mg / l) and manganese 0.3 mg/l (MAC = 0.05 mg / l).



KOMUNALNE VODE
COMMUNAL SEWAGE WATER

PPOV Kraljevo

Generalni projekat postrojenja za prečišćavanje otpadnih voda grada Kraljeva

Izradu generalnog projekta sa prethodnom studijom opravdanosti za kanalizacioni sistem, kao i za postrojenje za prečišćavanje otpadnih voda grada Kraljeva, finansirala je Evropska unija kroz projekat podrške u pripremi projekata za IPA III komponentu (PPF4) na predlog Ministarstva energetike, razvoja i zaštite životne sredine.

Inženjeri Sektora ekologije i tretmana voda su, kao sastavni deo projektnog tima PPF4 ispred Louis Berger-a, uradili kompletnu projektnu dokumentaciju, koja pored generalnog projekta kanalizacione mreže i postrojenja za grad Kraljevo, obuhvata i generalne i idejne projekte kanalizacione mreže i PPOV-a za Brus i Blace.

WWTP Kraljevo

General Design for the Wastewater Treatment Plant in the City of Kraljevo

Development of the general design with the pre-feasibility study of the sewage system and Wastewater Treatment Plant in the city of Kraljevo is funded by the European Union through the support project in the preparation of designs for IPA Component III (PPF4) on the proposal of the Ministry of Energy, Development and Environmental Protection.

Engineers from the Ecological and Water Treatment Sector in Delta Inženjering, as an integral part of the design team PPF4 of Louis Berger, have prepared a complete project documentation, which in addition to the general design of the sewerage network and plants for the city of Kraljevo includes the general and preliminary designs of sewerage network and WWTP for Brus and Blace.

PPOV Subotica
WWTP Subotica

Izrada mašinskog projekta izvedenog objekta centralnog postrojenja za prečišćavanje komunalnih otpadnih voda za grad Suboticu (140.000 ES), (linija vode, linija mulja, linija biogasa).

Developing of a mechanical design for the constructed facility of the central wastewater treatment plant for the city of Subotica (140,000 PE), (water line, sludge line, biogas line).

U cilju zaštite reke Save od zagađenja komunalnim otpadnim vodama poreklom iz gradskog područja Šapca i gravitirajućih prigradskih naselja krenulo se u realizaciju centralnog gradskog postrojenja za prečišćavanje otpadnih voda (PPOV Šabac).

PPOV Šabac

Tehnička kontrola glavnog projekta postrojenja za prečišćavanje otpadnih voda

S obzirom na veliki značaj izgradnje prečistača u našoj zemlji, Delta Inženjering (Sektor za tretman voda) je na zahtev JKP Vodovod-Šabac prihvatio da uradi tehničku kontrolu glavnih projekata postrojenja, kao i da pruži sve potrebne konsultantske usluge koje se tiču početka izgradnje samog postrojenja.

Predviđeno je da se na ovom postrojenju prečišćavaju prikupljene sanitarne otpadne vode kao i industrijske otpadne vode, koje su odgovarajućim predtretmanima dovedene do kvaliteta definisanog Uredbom o graničnim vrednostima emisije zagađujućih materija u vodi i rokovima za njihovo dostizanje.

Po kapacitetu, postrojenje za prečišćavanje otpadnih voda je projektovano u dve faze. Faznost je definisana na osnovu biološkog opterećenja u odnosu 2/3+1/3. Kapacitet PPOV za fazu IA iznosi 84000 ES, dok je za kraj projektnog perioda, odnosno za fazu IB, predviđeno proširenje na konačnih 126000 ES.

WWTP Šabac

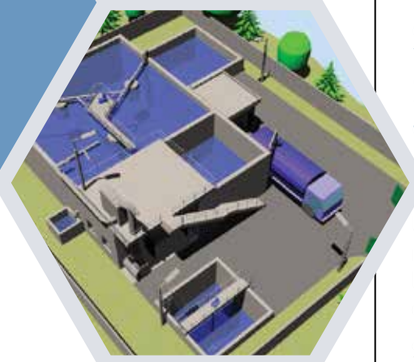
Technical Control of the Main Design for the Wastewater Treatment Plant in Šabac

In order to protect the river Sava from the pollution with communal sewage wastewater originating from the city of Šabac and belonging suburbs, the realisation of the central Wastewater Treatment Plant for the city of Šabac has started.

Given the great importance of building a wastewater treatment plant in our country, Delta Inženjering (Ecological and Water Treatment Sector) at the request of Public Utility Company for Water System of Šabac has agreed to carry out technical inspection of the main design and to provide all necessary consulting services relating to construction of the plant.

It is planned that this facility treats the collected household sewage and process wastewater, which is brought to the quality defined by Regulation on emission limit values in waters and deadlines for their achievement (Official Gazette of RS, No. 67/11, 48/12) by the appropriate pre-treatment.

According to the capacity, the wastewater treatment plant was designed in two phases. Phasing is defined by a biological load in relation 2/3 +1/3. The capacity of wastwater treatment plant for Phase IA is PE 84000, and for the end of the project period, i.e. Phase IB, was planned an extension to the final PE126000.



PREČIŠĆAVANJE SANITARNO-FEKALNE VODE
SANITARY SEWER WATER TREATMENT

U opštini Blace je nekada davno izgrađeno postojenje za prečišćavanje komunalnih otpadnih voda, koje danas nije u funkciji. Na istoj lokaciji predviđena je izgradnja potpuno novog postrojenja, koje bi odgovorilo savremenim zahtevima u pogledu zaštite životne sredine.

Srednji protok otpadne vode iznosi 20,1 l/s (q24), dok je maksimalni časovni protok (q12) 144,4 m^3/h, odnosno iznosi 40,2 l/s. Organsko opterećenje za 10 500ES (što odgovara kraju projektnog perioda) procenjeno je kao 630 kg BPK5/dan.

U okviru idejnog tehnološko-mašinskog projekta, projektanti Delta Inženjeringa postavili su koncept prečišćavanja, koji odgovara zaštiti vodoprijemnika koji je osetljiv na eutrofikaciju, i ponudili moderna tehnička rešenja.

Za primarni tretman otpadne vode (uklanjanje krupnih nečistoća, čestica peska, te masti i ulja) predviđena je kompaktna predtretmanska jedinica. Sekundarno prečišćavanje i uklanjanje nutrijenata (azota i fosfora) realizovano je u sekvencijalnim šaržnim reaktorima (SBR). Ciklus svakog SBR reaktora podrazumeva smenu nekoliko faza: punjenje sa reakcijom, reakciona faza, taloženje mulja i odlivanje efluenta.

PPOV Blace
Postrojenje za prečišćavnje sanitarno-fekalnih otpadnih voda

WWTP Blace
A Treatment Plant for Sanitary-Sewer Wastewater in the Municipality of Blace

A treatment plant for sanitary-sewer wastewater in the municipality of Blace was built a long time ago, but it is not functional. At the same location it is planned the construction of a brand new plant. The plant would respond to modern demands in terms of environmental protection.

The average flow of wastewater is 20.1 l/s (q24), while the maximum hourly flow is (q12) 144.4 m^3/h, i.e. 40.2 l/s. The organic load for 10 500PE (corresponding to the end of the design period) is estimated as 630 kg BPK5/day.

In the preliminary technological and mechanical design, the project engineers of Delta Inženjering set up the concept of treatment corresponding to protection of water recipient that is sensitive to eutrophication and offer modern technical solutions.

For the primary wastewater treatment (removal of large debris, sand particles, grease and oil) is planned a compact pretreatment unit. The secondary treatment and nutrient removal (nitrogen and phosphorus) were implemented in a Sequential Batch Reactor (SBR). A cycle of each SBR involves shifting in several phases: filling with the reaction, reaction phase, precipitation of sludge and effluent drain.

Akumulacija Ćelije nastala je pregrađivanjem reke Rasine i svrstana je u kategoriju izvorišta prvog ranga za međuregionalno i regionalno vodosnabdevanje. Pijaćom vodom iz ovog izvorišta snabdeva se preko 87% stanovnika Kruševca i okolnih naselja. U sklopu aktivnosti, koje za cilj imaju produžetak veka akumulacije, predviđena je izgradnja postrojenja za prečišćavanje komunalnih otpadnih voda opštine Brus.

Projektantski tim Delta Inženjeringa angažovan je na poslovima izrade projektne dokumentacije za buduće postrojenje. Obrađeni su idejni tehnološko-mašinski projekat, idejni elektroprojekat i idejni građevinski projekat, te se u potpunosti može sagledati obim i novčana vrednost radova za kompletnu izgradnju postrojenja.

Populacija i produkcija otpadnih voda iz industrije u opštini Brus, za projektni period do 2037. godine, procenjeni su na 10.500 ekvivalentnih stanovnika. Kao projektni parametri usvojeni su dnevna količina otpadnih voda od 1.732 m^3/dani i vršni časovni protok od 144,4 m^3/h.

PPOV Brus
Postrojenje za prečišćavnje sanitarno-fekalnih otpadnih voda

WWTP Brus
A Treatment Plant for Sanitary-Sewer Wastewater in the Municipality of Brus

The Ćelije reservoir is formed by damming of the River Rasina and is classified in the category of first-rank wellsprings for interregional and regional water supply. With drinking water from this wellspring is supplied over 87% of Kruševac and surrounding villages. Within the activities which aim is extension of accumulation lifetime is planned the construction of a sanitary-sewer wastewater treatment plant for the city of Brus.

The design team of Delta Inženjering is involved in the preparation of project documentation for a future plant. Preliminary technological and mechanical design, preliminary electrical design and preliminary construction design were processed so that the scope and monetary value of the works for complete construction of the plant can be fully considered.

Population and production of process wastewater from the industry in the municipality of Brus for project period up to 2037 have been estimated at about 10,500 population equivalent. As design parameters were accepted daily wastewater amount of 1,732 m^3/day and maximal hourly flow of 144.4 m^3/h.

5 DRUŠTVENO-KORISNE AKTIVNOSTI

SOCIALLY USEFUL ACTIVITIES

KULTURNO-OBRAZOVNI PROGRAM	CULTURAL AND EDUCATIONAL PROGRAM
POMOĆ ZDRAVSTVENIM USTANOVAMA	AID FOR HEALTH CARE INSTITUTIONS
HUMANITARNA POMOĆ	HUMANITARIAN AID
SPORTSKI PROGRAM	SPORTS PROGRAM

DRUŠTVENO KORISNE AKTIVNOSTI U KOJIMA JE DELTA INŽENJERING UČESTVOVAO

Kulturno - obrazovni program

- Delta Inženjering je 2001. bio ktitor crkve Svetog Vasilija Ostroškog čudotvorca na Bežanijskoj kosi
- Pomoć u izgradnji crkve u Smederevu
- Donatorstvo skupa „Dan procesne tehnike - 40 godina nastave" (1999)
- Zahvalnica iz udruženja univerzitetskih profesora i naučnika Srbije za stručni doprinos radu UPNS
- Promocija knjige „Priručnik za projektovanje"
- Promocija knjige „O vodama" (Delta Inženjering sponzor izdavanja)
- Promocija knjige „Organization of planning" (leadership and managerial dimensions)
- Promocija knjige „Trgovinska revolucija"

Pomoć zdravstvenim ustanovama

- Donacije KBC „Dr Dragiša Mišović" Beograd (2003)
- KCS (Kliničko bolnički centar) - razvod medicinskih gasova
- GAK Višegradska - razvod medicinskih gasova
- Bolnica „Dr Dragiša Mišović" - Izvođenje elektroradova na dva sprata i razvod medicinskih gasova
- Pomoć Gradskoj Opštini Lazarevac (novčana pomoć domu zdravlja, bolnici u nabavci opreme)
- Donacija za pomoć fizičkim licima sa sedištem u Lazarevcu u medicinske svrhe, odnosno za troškove lečenja, finansiranja operativnih zahteva i rehabilitacije, teških bolesti socijalno ugroženih osoba (ukoliko nije ostvarljivo preko fonda za socijalno osiguranje)

Humanitarna pomoć

- Humanitarna pomoć narodu trebinjskog kraja (1996)
- Pomoć fondu NJ.K.V. Katarine Karađorđević, deci iz sirotišta i deci ometenoj u razvoju
- Pomoć udruženju dece ometene u razvoju
- Pomoć poplavljenima u Lazarevačkom okrugu

Pomoć sportskim klubovima

- Sponzor Karate kluba „Budućnost" (2006, 2007, 2008)
- Sponzor Vaterpolo kluba „Crvena zvezda"
- Pomoć ženskom Rukometnom klubu „Crvena zvezda"

THE SOCIALLY USEFUL ACTIVITIES IN WHICH DELTA INŽENJERING HAS PARTICIPATED

Cultural And Educational Program

- A ktitor of the church of St. Basil of Ostrog, Bežanijska Kosa (2001)
- Aid for building a church In Smederevo
- A donation to the gathering called "A Day of Processing Techniques - 40 Years of Teaching" (1999)
- A contribution to the work of the Serbian University Professors and Scientists Association
- A promotion of the book called "Design manual" (2007)
- A promotion of the book called "About water" (The edition was sponsored by Delta Inženjering) (2013)
- A Promotion Of The Book Called Organization Of Planning (Leadership And Managerial Dimensions)
- A promotion of the book called "Commercial Revolution"

Aid for health care institutions

- A donation to the medical centre "Dr Dragiša Mišović" - Dedinje, Belgrade (2003)
- CHC (Clinical hospital centre) - distribution of medical gases
- Gynecology and obstetrics clinic Višegradska - distribution of medical gases
- Hospital "Dr Dragiša Mišović " - execution of electric works on two floors and distribution of medical gases
- Aid for the municipality of Lazarevac (financial aid to the health center and hospital forpurchase of equipment)
- Donation to help individuals who live in lazarevac for medical use, i.e. for the cost of treatment, funding of operations and rehabilitation, serious diseases treatment, funding of surgical interventions and rehabilitation of socially disadvantaged persons (unless it is achievable through the social insurance fund.

Humanitarian aid

- Humanitarian aid for the people of Trebinje region (1996)
- Aid for the fund of her Royal Highness Katarina Karađorđević for children from orphanages and children with disabilities
- Aid for the association of children with disabilities
- Aid for the flooded in Lazarevac county

Aid to the sports clubs

- A sponsor of the Karate Club "Budućnost" (2006, 2007, 2008)
- A sponsor of the Waterpolo Club "Crvena zvezda"
- Aid for the women's Handball Club "Crvena zvezda"

IMPRESUM

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Urednik:
Aleksandra Todorović-Sučević,
Direktor opštih poslova

Dizajn:
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