

CURRICULUM VITAE

Name	Ian Arentz
Title	General Manager
Year of Birth	1980
Address	Scheldestraat 118A 2515TG, The Hague The Netherlands
Education	B. Sc. Degree Mechanical Engineering The Hague University of Professional Education
Summary	Mr. Arentz has more than 14 years of professional Engineering and Consultancy experience in the field of Industrial Fire Protection
Memberships	NFPA nr.: 2986292

Career

<i>Jan. '18 – Current</i>	Reliant Fire Protection B.V., The Hague, the Netherlands Function: General Manager Working on both Consultancy and large scale EPCM projects.
<i>May '16 – Feb. '18</i>	PYRO-IFPS B.V., The Hague, the Netherlands Function: General Manager Working on both Consultancy and large scale EPCM projects.
<i>Mar. '07 – Apr. '16</i>	Jacobs Engineering, Leiden, the Netherlands Employee dept. "Safety & Loss Prevention - Design HSE" Function: Discipline Supervisor / Sr. Consultant Working on both Consultancy and large scale EPCM projects

Key working activities as Discipline Supervisor / Sr. Consultant include, but are not limited to: Man hour Estimating, Department Workload Planning, Candidate Interviewing, Marketing, Technical Contracting Improvement, Managing & Expediting Project Targets, Coordination of Work Instructions Improvement, Assisting Clients with Scope of Work and Design Basis Development, Basic and Detail Engineering (ALARP approach), P&ID's- PFD's- & PEFS Development, Fire Risk Assessments, Heat Consequence Modeling (PHAST), Hydraulic Calculations & Design for Private Fire Service Mains (PIPE2000), Detailed Material Specifications & Requisitions, Technical Data Sheets, MTO's, Budget Estimates, Technical Bid Analyses, Value Engineering, Site Surveys, Performing Studies on Client Standards (SAES, DEP, GP, GIS, SS, MS etc.) and Local- & International Guidelines (API, NFPA, IP, PGS, ANSI, ASME, BS, DVGW, FM, ISGOTT, SIGTTO etc.) Liaise with Fire Brigades, Training of Colleagues, HAZOP participation for Fire Protection P&ID's.

Projects

- 2017 - ongoing* **Vopak Styrene, Europoort, Rotterdam**
EPCM project supporting Fluor Netherlands B.V.
Under this project 15 new fixed-roof storage tanks will be constructed increasing capacity with 22.670 m³.
Overall responsibilities for this project include: implementation of new PGS29 requirements, SOW preparations, contracting support, technical bid evaluations, permit application reviews and firewater pump capacity verifications.
- 2017 - ongoing* **MSD Noxafil Relocation & PGS15 Warehouse, Oss**
Engineering & Procurement project supporting Fluor Netherlands B.V.
Noxafil Relocation: automatic Sprinkler system design for clean rooms based on FM-data sheet requirements.
PGS15 warehouse: supporting partner IV-Industry in the fire protection design. Including: wet- and dry type automatic sprinkler system, gaseous extinguishing systems, fire alarm and evacuation and firewater catch basin design.
- 2017* **HES Hartel Tank Terminal**
Lump-Sum project supporting Fluor Netherlands B.V.
Industrial fire protection design, for the HES Hartel Tank Terminal project. Under this project 52 new storage tanks will be constructed with a total capacity of 1.300.000 m³ and 32m¹ height.
Overall responsibilities for this project include: implementation of new PGS29 requirements, hydraulic calculations, SOW preparations, contracting support, technical bid evaluations, permit application reviews and firewater pump design. Project terminated by Client HES.
- 2016 - 2018* **Audi - Automatic Sprinkler Design Fabrication Hall A, Brussels**
3D sprinkler ECM project, subcontracted by Arcadis
Overall responsibilities for this project include: 3D automatic sprinkler design in "TriCAD Venturis" for new all-electric Audi Q7 SUV Audi fabrication Hall, hydraulic calculations (software prog. HASS), sprinkler schematics, isometrics, Contractor supervision and liaison with Brussels Authorities. All deliverables in accordance with German HOAI standards.
- 2014 - 2016* **BP Rotterdam Refinery - HF ALKY Water Mitigation Project, the Netherlands**
EPCM project
Overall responsibilities for this project include: calculate hydraulic performance of existing fire water distribution ring main system currently >40 years old. Replace existing fire water pump station vertical turbine fire water pumps with "Hydropack" fire pumps. Liaise with the National Authorities and Fire Brigade. Value+ suggested & approved by client with estimated value of >€4,5 mln; no new 16" fire water distribution header required (1,5 km) proven by hydraulic analyses (KY PIPE software), no new power cable required (1,5km). New vertical turbine jockey pump, 21 elevated fire water monitors large capacity type elevation >12 meters. Hydraulic performance of HF water

scrubbing wall calculated for exact orientation. New bucket type strainers specified, isolation block valves specified with MOV's feeding the monitors, FAT & SAT testing, technical requisitions, and technical bid analyses, MTO & Cost Estimates (25% & 10%).

2014 – 2016

Shell Europoort - Upgrade Fire Fighting System, the Netherlands EPCM project

Overall responsibilities for this project include: calculate hydraulic performance of existing fire water distribution ring main system, currently >40 years old. Replace existing fire water pump station horizontal split-case fire water pumps taking water from water tanks in very poor condition with new "Hydropack" type pumps taking water directly from the harbor (unlimited supply). New vertical turbine jockey pump, FAT & SAT testing, technical requisitions, technical bid analyses, MTO & Cost Estimates (25% & 10%).

2015

Saudi Aramco - Luberef II, Saudi Arabia

Feasibility study

Overall responsibilities for this project include: check impact planned upgrade on Fire Protection facilities & calculate hydraulic performance of existing fire water distribution ring main, Fire & Explosion Philosophy and Fire Protection Design Basis.

2014 – 2015

ExxonMobil - Bio-Ethanol Blending at Depot, Rotterdam, the Netherlands

Non-Jacobs permitting project

Jacobs was requested to provide input to this Exxon / SPIE Controlec project with regards to the building permit application, see below.

2014 – 2015

ExxonMobil - Chemical ROP Creep 2015, Rotterdam, the Netherlands

Permitting project

Overall responsibilities for this project include: assisting Exxon with the building permit application procedure.

Jacobs has developed a "Fire Protection Philosophy" template report that covers all facets the VRR / BPC / DCMR (Veiligheids Regio Rotterdam / Brand Preventie Commissie / Dienst Centraal Milieubeheer Rijnmond) evaluates for compliance with the applicable PGS codes (Publicatie Gevaarlijke Stoffen) and Dutch Building decree.

2014

Vopak - Industrial Terminal Maasvlakte II, Rotterdam, the Netherlands

Conceptual Engineering for Grass root Project

Overall responsibilities for this project include: feasibility studies, high level worst case fire scenario studies, firewater demand calculations and cost estimating

2013 – 2014

Vopak - VTB Expansion Tankpit 2&4, Botlek Rotterdam, the Netherlands

Conceptual and Basic Engineering Project.

Overall responsibilities for this project include: heat radiation calculations, hydraulic calculations and reporting, bid book contract preparation, P&ID preparation and cost estimating.

2013 – 2014

Vopak - Unlocking VTE, Europoort Rotterdam, the Netherlands
Conceptual and Basic Engineering Project.
Overall responsibilities for this project include: heat radiation calculations, hydraulic calculations and reporting, updating firewater layout drawings, P&ID preparation and cost estimating.

2013 – 2014

Vopak - Terminal Hamburg, Expansion Hohe Schaar, Germany
Conceptual Engineering Project: expansion of bulk storage capacity at existing terminal.
Overall responsibilities for this project include: local FP requirements study, preparation of Fire Protection philosophy report, heat radiation simulation study and a 25% cost estimate covering multiple options.

2013 – 2014

Vopak / Shell / Greenergy - Thames Oil Port Terminal, Coryton, UK
EPCM project: converting an old Petroplus refinery into a large throughput bulk storage terminal for the Morzine Ltd (VSG) consortium. Combined effort between Jacobs Leiden, Reading and Manchester.
Overall responsibilities for this project include: multiple site surveys, preparation and presentation of FP Recommendation reports, heat radiation studies, hydraulic calculations & reporting, performance testing with the Essex Fire Authority, contacting local vendors for budget quotes and delivery dates, overall planning and expediting to upgrade the fire safety systems to an acceptable level within a limited timeframe.

2012 – 2015

EdeA - Chemelot Geleen, the Netherlands
Engineering and construction of 4 package unit firewater pumps replacing 5 existing sets.
Overall responsibilities for this project include: conceptual-, basic- and detail engineering, advising client EdeA how to replace the firewater pump sets without losing capacity during construction, site surveys, firewater ring main hydraulics review & advise, P&ID preparation, technical requisitions, value engineering, cost estimating, technical bid analyses, testing and commissioning.

2012

Vopak - Terminal Leftbank, Kallo, Belgium
Technical contracting for terminal expansion project.
Overall responsibilities for this project include: challenging basic engineering work done by FPC Belgium, informing client Vopak on design issues, Bid Book preparation based on FP philosophy prepared by FPC, overall project coordination and aligning discipline interfaces.

2011 – 2013

BP - Effluent Treatment Plant (ETP), Rotterdam, the Netherlands
Engineering and construction activities on deluge cooling and foam extinguishing systems for 2 storage tanks.
Overall responsibilities for this project include: conceptual-, basic- and detail engineering, technical contracting, technical bid analyses, close vendor communication (not working in the 3D PDMS model), aligning

interdiscipline interfaces, heat radiation calculations, water- and foam demand calculations, pipe sizing, testing and commissioning.

2012 – 2013

Evonik - Apollo 14, Jurong Island, Singapore

Basic Engineering Project: New Nylon 12 Chemical Grassroot Facility. Combined effort between Jacobs Leiden, Meerssen, Mumbai & Singapore including: interpreting Singapore safety codes & standards, fire protection philosophy, firewater distribution layout drawings including tie-ins to existing Me5 grid, tendering documents, MTO's, 15%- & 10% cost estimates.

2012 – 2013

Exxon - RAP Liquid Isoformer Project (RLIP), Rotterdam, the Netherlands

FEED project to increase the site energy efficiency, at current annual production levels of Para-Xylenes and Ortho-Xylenes by re-equilibrating ortho- and para-xylene depleted PXU filtrate. Overall responsibilities for this project include: site survey, coordination with client Exxon & sire fire brigade, worst case fire scenario study, fire protection philosophy, monitor coverage layout drawings, technical contracting and technical bid analyses.

2011 – 2015

Saudi Aramco - Luberef, Saudi Arabia

Expansion of Lubricants factory, FEED large scale project. Overall responsibilities for this project include: Hydraulic calculations of both new and existing firewater distribution network, firewater distribution layout drawings including tie-ins to existing grid, upgrade existing firewater pumps and storage tanks, P&ID's, study existing facility and incorporate SAES directives, material selection, multiple Scope of Work specifications, fire protection Design Basis specification, MTO's & input to cost estimates, liaise with Luberef fire brigade, fire zoning and monitor coverage drawings.

2011

Vopak - Chemicals EMEA, Port la Nouvelle, France

Conceptual Engineering project for Grassroot Terminal. Overall responsibilities for this project include: Firewater and foam demand calculations, heat radiation calculations, hydraulic calculations and design including 25% Cost Estimate.

2011

Vopak - TEW, Rotterdam, the Netherlands

Conceptual Engineering project for Grassroot Terminal. Overall responsibilities for this project include: Firewater and foam demand calculations, heat radiation calculations, hydraulic calculations and terminal plot plan coordination researching 2 alternatives followed-up by 25% cost estimates for both alternatives.

2011

Dong - Terminal Hejre, Denmark

Crude Stabilization, extended Basic Engineering project. Overall responsibilities for this project include: Hydraulic calculation of both new and existing firewater distribution network, check compliance with latest fire protection industry standards.

Curriculum Vitae – January 2018

- 2011 – 2013** **NAM GLT+, NORG, the Netherlands**
Underground Gas Storage facility expansion including new Water Condensate Storage Tank, Basic Engineering project.
Overall responsibilities for this project include: Incorporate latest PGS29 & permitting (WM) requirements to both new and existing facilities, check hydraulics of existing firewater distribution network, incorporate heat radiation calculations results, storage tank & equipment cooling, bund protection and firewater pump setup
- 2011 – 2012** **Shell Netherlands Refinery (SNR) - Rotterdam, the Netherlands**
Implementation of Trigonox 421 P50 in the Sannest plant, Basic and Detail Engineering project.
Overall responsibilities for this project include: P&ID's, drawings deluge system, BOD report, MTO, fire proofing consultancy, program of fire protection demands (PvE), Scope of Work report (UPD), liaise with sites fire brigade and preparing tendering packages.
- 2010 – 2011** **Borealis - Stenungsund, Sweden**
Firewater Pond, Basic Engineering project.
Court order to upgrade firewater capacity for existing PE factory.
Overall responsibilities for this project included: site survey + visit, clear and define scope, layout DWG's firewater pump room & firewater storage tank setup, P&ID's, routing firewater lines, material selection, requisition, technical bid analyses, liaise with sites fire brigade and advise on hydraulic distribution firewater network
- 2010** **Vopak - Terminal, Lesedi, South-Africa**
High level Conceptual Engineering project for Grassroot Terminal.
Overall responsibilities for this project included: Heat consequence modelling, storage tanks arrangement and spacing, MTO + 40% & 25% cost estimate, hydraulic calculations, hydraulic design and firewater storage tank sizing.
- 2010 – 2011** **Vopak - Terminal, Pengerang, Malaysia**
Extended Conceptual Engineering project for Grassroot Terminal.
Overall responsibilities for this project included: interpreting Malaysian codes & standards, hydraulic calculations and design, water & foam demand calculation, heat consequence modelling, heat radiation layout DWG's, PFD's, fire protection philosophy, firewater pump selection and technical bid analyses.
- 2010 – 2011** **Vopak - Terminal, Marmara, Turkey**
Grassroot Hydrocarbons Terminal with Jetty, Extended Basic Engineering project.
Overall responsibilities for this project included: Hydraulic calculations and design, heat consequence modelling, interpreting Turkish safety codes & standards, PFD's and P&ID's, firewater pump selection, tendering documents, MTO's, technical bid analyses, implementing scope changes and coordination with the client.

Curriculum Vitae – January 2018

- 2009 – 2011* **Shell Global Solutions Shell Refinery - Pernis Rotterdam, the Netherlands**
PRIMA Waterfront - Jetty 32 Repair, EPCM project.
Overall responsibilities for this project include: coordination with the client counterpart and fire brigade, fire protection philosophy, model reviews, material selection, MTO's, technical bid analyses, value engineering and construction coordination.
- 2008 – 2010* **Vopak - Terminal Bahamas**
Greenfield Expansion Hydrocarbons Terminal, Extended Basic Engineering project.
Overall responsibilities for this project included: Hydraulic calculations and design, heat consequence modelling, PFD's and P&ID's, firewater pump selection, tendering documents, MTO's, technical bid analyses, implementing multiple scope changes and coordination with the client.
- 2009* **Vopak - Terminal Yangpu, China**
Grassroot Hydrocarbons Terminal, FEED project.
Storage tanks terminal project for the Yangpu harbour area.
Interpreting Chinese standards and codes, front end engineering services to function as bases for the upcoming Basic Design phase.
- 2008 – 2010* **Essent - Gronau, Germany**
German Epe Cluster, Underground Gas Storage, EPCM project.
Overall responsibilities for this project include: Hydraulic calculations and design, technical recommendations for underground firewater extension. Facilitate in the upgrade and extension of a technical inferior fire protection installation. Providing insight in the financial consequences of proposed technical solutions incl. technical bid analyses.
- 2008 – 2009* **National Oil Reserve Agency (NORA) - Cork, Ireland**
Global Liquid Storage Greenfield, FEED project.
Tactical hydrocarbon products storage serving a National purpose.
Providing engineering support on a consultancy bases. Presenting conclusions and plot plan arrangement recommendations to the client in a presentation.
- 2008 – 2009* **BP Amsterdam Terminal - Amsterdam, the Netherlands**
Bio-Ethanol, EPCM project.
Retrofitting two hydrocarbon products storage tanks fit for Ethanol storage. Reroute firewater and foam headers and assist in tank design changes for fire protection purposes. Preparation of requisitions followed up by technical bid analyses and construction coordination.
- 2008 – 2009* **BP Amsterdam Terminal - Amsterdam, the Netherlands**
BAT Theseus project
Engineering, Procurement and Construction Management for:
New package-unit containerised diesel driven fire water pumps on dedicated platform above harbour. Jetty fire protection systems design, including; escape way protection (water curtains), jetty structural steel cooling, oil booms and new elevated fire monitors for ship protection.

Hydraulic calculations for complete fire water distribution ring main.

2007 – 2008

Sirte Oil Company - Marsa al Brega, Libya

LNG Processing Plant Rejuvenation, Basic Engineering project.
Joint effort between Jacobs & Shell Global Solutions
Rejuvenation project involving a 40 year old LNG processing plant to guarantee safe and reliable performance for another 20 years of operations. Large scale project, consisting of; complete firefighting / protection installation replacement upgraded with the latest cutting edge technology. Site survey + visit in a combined effort with customer Shell Global Solutions.

2007

Exxon/Mobil - Botlek Rotterdam, the Netherlands

RAP_PxD Chemical Paraxylene & Benzene Factory, Basic and Detail Engineering project.
Overall responsibilities for this project included: Hydraulic analyses, design, calculation and technical recommendation of an underground firewater extension. Formatting the technical solutions and recommendations in a presentation.

2007

Neste Oil - Botlek Rotterdam, the Netherlands

Bio-Diesel Second Generation (B2G), Conceptual Engineering project.
Overall responsibilities for this project included: Hydraulic design and calculation of grass root underground firewater distribution network for new Bio-Diesel terminal.

2007 - 2009

Kuwait Petroleum - Europoort Rotterdam, the Netherlands

New SRU FEED / SO₂ WGT, Basic and Detail Engineering project.
Overall responsibilities for this project included: Hydraulic analyses, design, and technical recommendation of an underground firewater extension. Distillate scope definitions from scattered project information. Providing technical solutions, solving existing issues and coordination with both the client and local fire brigade.

2006 - 2007

Schiphol Airport (Amsterdam), the Netherlands

Employee dept. "Imtech Projects North West B.V."
Work scope; assistant project leader, working on a number of large scale sprinkler and HVAC projects for the "Utility Industry" at Schiphol Airport.
Providing customers with total technical solutions; offering a safe environment for travelers and employees.
Overall responsibilities for these projects included; updating the financial stats of both running and finalized projects. Managing of credit and debit balances and reporting results to the management. Preparing estimates and proposals for our customers, steering draftsmen and mechanics to meet and challenge project milestones. This included ordering of materials and tracking delivery dates.

2005 - 2006

The Council of State, The Hague, the Netherlands

Work scope; project engineering, working on large scale HVAC project providing our customer with total technical solutions.

Total HVAC installations for historical building being completely rebuilt preserving its authentic characteristics.

2005 – 2006

The Ministry of Finance, The Hague, the Netherlands

Work scope; project engineering, working on large scale HVAC project providing our customer with total technical solutions.

Complete new HVAC and firefighting installation including an upgrade of the existing systems.

Specialist Training

2016	Safeti-NL, Quantitative Risk Analysis, subsidiary of PHAST
2016 (<i>renewed</i>)	SCC – Safety for Operational Supervisors, VOL-VCA
2012	Deluge valves Seminars – Bermad Israel
2011	Management Leadership – Jacobs College
2011	FM Global Seminar – Sprinkler Technology Developments
2011	KY PIPE – Advanced Hydraulic Modeling, Houston
2011	KY PIPE – Surge Modeling, Houston
2011	BP – Inherent Safer Design
2010	ATEX – Introduction Course, Jacobs College
2010	EPCM Discipline Lead Course, Jacobs College
2008	NFPA13 – Installation of Sprinkler Systems, NFPA Las Vegas
2008	NFPA20 – Installation of Stationary Pumps for Fire Service, NFPA Las Vegas
2008	NFPA25 – Water Based Fire Protection Systems, NFPA Las Vegas
2008	H ₂ S Instruction – Deltalinqs
2006 – 2007	M.Sc. Scientific Building Physics Course, TVVL Amersfoort

Linguistic Skill

Dutch	Mother tongue
English	Fluent
German	Moderate