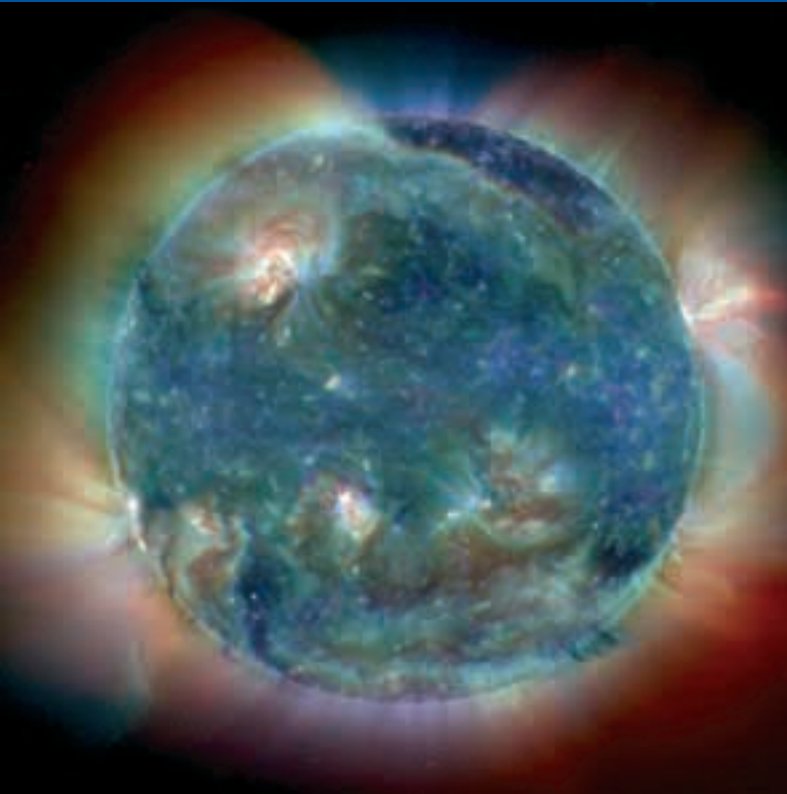


EDITION 2



Electromagnetic compatibility



Conception, design, and
technical guidance



LABORELEC

The technical Competence Centre
in energy processes and energy use.

From R&D to operational assistance.

New concept - New design

Extension of existing installations

Tiny ripples make huge waves

The identification of electromagnetic sources that lead to malfunctions can be very subtle. Sometimes just starting an engine, using a mobile phone or activating power electronics can be enough. Disturbances can dramatically affect electronic systems, generating huge production losses or limit the reliability of vital equipment. In the worst cases they may constitute a threat to safety.

Guaranteeing EMC by a theoretical approach

Guaranteeing 'electromagnetic compatibility' has a cost.

If you want a quantification of the financial impact of the malfunction risk, you can rely on Laborelec's Electromagnetic Compatibility product line EMCS.

The evaluation of the malfunction risk is not an easy job and requires the following:

- identify the disturbance sources;
- check the possible effect on the equipment by evaluating the coupling provided by the installations;
- get information about the equipment's susceptibility;
- propose solutions adapted to each situation

These essential points are all the tasks of specialists.

What do you require to launch a new project?

In reality, when you launch a new project, EMCS suggests working in three steps:

1. Coaching/consultancy during the drawing of the plans to apply the essential EMC rules. We can assist you in writing the specifications of your project and in choosing adequate material according to the EMC philosophy. A good base is fundamental to globally enhance the electromagnetic compatibility.
2. Coaching/consultancy/technical guidance during the foundation and the rise of the structural work, to supervise the correct implementation of the EMC requirements concerning the reinforced concrete, earthing and grounding, the electrical boards, the cable trays, etc.
3. Coaching/consultancy/technical guidance throughout the final phase concerning the laying of cables, ground connection, cable board entrance, shielding connection in the boards, equipment installation, etc.

EMC course available for you and your team

Laborelec offers an EMC course tackling, among others, EMC basics, earthing and bonding grid design, cabling, and lightning protection. The course can be given in French, Dutch, or English. It is a thorough insight into EMC best practices given by specialists. (For more information see p. 4)

Five reasons for you to choose Laborelec

1. You have one-stop shopping

Laborelec's EMC Product Line includes a total service in:

- Electrical systems, emergency power supplies and networks
- Power systems (TN, TT or IT)
- Earth and ground network
- Shielding, filtering and cabling methods
- Overvoltage protection, lightning protection
- Evaluation of the effect of high voltage cables on nearby fluid pipelines

2. You get access to more than 40 years of experience

Take advantage of Laborelec's decades of experience in consultancy and coaching, from concept to realization of all kinds of electrical appliance and installation for industrial or domestic use.

3. You increase the profitability of your installations

You make the best use of your electrical installations if experts implement the electromagnetic compatibility rules in your premises.

This is key when relying on the success of your factory process and improving the reliability of your vital equipment.

4. You benefit from independent and confidential advice

Laborelec is not selling or installing equipment. This guarantees you neutral and independent advice.

5. You are supported by a recognized and accredited laboratory

Our EMC strategies and technical advices have proved themselves in numerous projects. They are recognized for their efficiency and reliability.



Have a look at our testimonials!

Training courses for an efficient EMC strategy

Electrical installations at power plants and industrial sites function properly only if supported by an appropriate and strong EMC strategy. This means one that eliminates all risks of EM problems and that enables to integrate latest technologies without EM disturbances. Laborelec EMC courses teach you how to reach this objective. Two examples are given below.

New devices, new EMC concept

Today, most plants are gradually switching from analogue to digital devices and using more power electronic devices. These produce EM disturbances that are in a higher frequency range than the usual 50 Hz emissions. The EMC strategy of the plant is often not adapted for the integration of such technologies. It therefore needs to be rethought.

Laborelec developed a one-day training course for such cases. All aspects of earthing and bonding grid design are tackled. A parallel is often made between theory and practical issues encountered by the trainees. Upon completion, trainees are able to reconfigure the plant EMC concept in-house.



Good EMC avoids troubleshooting

Laborelec has developed a complete training package that will help you eliminate the necessity of troubleshooting problems caused by EM disturbances. The course explains EMC basics, presents troubleshooting issues and their solutions, and gives practical implementation tips. Lightning protection is also covered.

Testimonials from trainees

- 'This course made us realize that proper EMC strategy must be implemented right from the conception phase of our projects. It gives valuable advice that will avoid unnecessary costs later on.'
Bruno Piette, Infrabel
- 'This course gave us a wide overview of damage caused by lightning and of related solutions. This knowledge is a strong base for us to develop a Lightning and EMC Department at INEO.'
Michel Burgevin, INEO
- 'Laborelec gave us concrete tips on identifying the cause of EM problems and defining appropriate remedies. Now we will be able to provide our clients with concrete technical advices when confronted with EMC problems.'
Bruno Fontanel, Electrabel

Testimonials

INFRABEL

'For our substation in Pepinster, we wanted to implement proper EMC rules right from the construction phase. We had experienced EM problems at another substation that had led to financial losses. We didn't want it to happen again, so we called upon Laborelec. They gave us advices on earthing and bonding grid design as well as concrete tips for implementation. These included welding type and cable connection methodology. From now on, we will apply these recommendations in every new project. This will avoid further troubleshooting, thus saving us a great deal on money.'

INFRABEL



NGK (Baudour)

NGK produces ceramics for automotive catalytic converters. It has installed a new production unit that uses a high frequency drying oven at 41,680 MHz.

To limit EM emissions outside NGK premises, Laborelec gave advice regarding the cladding of the hall and measured its HF attenuation. It also measured EM fields to ensure that the new unit complies with regulations on radio-electric disturbances and staff safety.

'We've been working with Laborelec for several years, making use of their EMC expertise with high frequencies. They offered us effective support in the setting up of our new line.'

Jean-Michel Bidelot
NGK

Testimonials

European building BERLAYMONT at Brussels

Laborelec's Electromagnetic Compatibility product line has been asked to evaluate the risk of malfunction for the future computer network. The malfunction concern was raised by the proximity of the connection computer board and of the low voltage power board as well as by the common route of the computer network with the power supply network.

'Within the context of the Berlaymont site, we called on Laborelec to check the conformity of certain types of ballast with the EMC standards on interference caused by electromagnetic emissions. We also asked Laborelec to carry out an on-site assessment of the interference risks due to the proximity of the information system to the low voltage power supply installations. These tests and studies fully satisfied our expectations in terms of the technical aspects and completion times.'



'Although various different people took part in the discussion and definition of the issues to be dealt with, there was a perfect understanding among all of them, and the presentation of reports was to our entire satisfaction. The preventive examinations, carried out case by case on the precise areas involved, enabled us to detect any possible problems due to faulty equipment or incorrect setting up operations. In this way, we were able to avoid the significant costs that such defects could have brought about.'

Lucien Delmee

Testimonials

Influence of HV Lines on metal pipelines for fluids

The proximity of electricity supply structures (HV lines and power for HST trains) to pipelines for fluids occurs frequently and (indeed) often cannot be avoided. The electric and magnetic fields, which are inextricably linked to electric energy supply, create voltage on the nearby pipelines.

If these pipelines are insulated from the earth (using a polymer type covering), an influence study may be necessary to check the effects with respect to:

- the safety of operational staff who may come into contact with a pipeline (handling, repairs);
- the deterioration of metal due to electrochemical corrosion (a phenomenon which occurs in the event of an insulation defect in the pipe);
- damage to the material connected to a pipe.

The mathematical study of an influence problem offers the following obvious advantages:

- before installing new pipelines, the project managers already have an idea of the voltages that may be induced on these pipelines and they can implement solutions during installation;
- if the pipeline is already in place, the study can predict the voltages induced under defective conditions, in contrast to on-site measurements.



Laborelec has provided its expertise for many years now to fluid transporting companies (Fluxys, Distrigas, Air Liquide), to Tractebel and Tucrail (construction of HST rail tracks in Belgium) in order to investigate the influence of power lines on pipelines in certain situations and, if necessary, propose effective solutions (earthing, double insulation).



Five reasons for you to choose Laborelec:

- you have one-stop shopping for your energy needs;
- you get access to more than 40 years of experience;
- you increase the profitability of your installations;
- you benefit from independent and confidential advice;
- you are supported by a recognized and accredited laboratory.



What is the meaning of «Electromagnetic compatibility» (EMC)?

Electromagnetic compatibility is the ability of a device or system to function satisfactorily in its electromagnetic environment without introducing any electromagnetic disturbances into that environment that might lead to any inefficiencies or malfunctions.

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in energy processes and energy use.
From R&D to operational assistance.

LABORELEC

Rodestraat 125
B-1630 Linkebeek • Belgium
Tel: + 32 2 382 02 11
Fax: + 32 2 382 02 41
HRB/RCB 307.906
BTW/TVA BE-400 902 582

www.laborelec.com

Responsible editor: Paul Lemmens

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Conrad BOTTU
Tel: + 32 2 382 03 60
Fax: + 32 2 382 06 49
conrad.bottu@laborelec.com

Jean-Michel MEUNIER
Tel: + 32 2 382 04 15
Fax: + 32 2 382 06 49
jean-michel.meunier@laborelec.com