

Compliance with basic rules: The challenge of dialogical, enabling and disciplinary management

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Abstract. Lying between two traditions of thought, one of which states that rules must always be respected (Weber, 1921), and the other that they can never be respected, this research suggests a third possibility, a contingent approach that distinguishes two types of rules: complex ones that cannot be scrupulously respected, and basic ones that are supposed to be strictly observed. Since the first type has been extensively studied, most of this article is devoted to basic rules and how they can be managed. In connection with collaborative management research carried out in a hospital in Île-de-France, we studied three activities: monitoring of peripheral venous catheters, sorting of healthcare waste and costing of hospital stays. After analysing breaches of basic rules for these activities, we propose corrective action of various kinds according to function, level of innovation and level of application. Regarding the latter, we have applied the recommendation of Reason (1997) which involves dealing with the problem of non-compliance with rules at three different levels: the organisational, engineering and individual levels. Whereas interventions carried out at the individual level have been widely discredited by studies of complex technological systems, our research shows their value when the relative simplicity of the situation makes it possible to formulate basic rules. Based on the observations made before and after implementing our proposed actions, we suggest adopting an approach to managing breaches of basic rules that we describe as dialogical, involving two complementary and antagonistic aspects: an enabling aspect and a disciplinary aspect.

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Contrary to the Weberian view, contemporary literature suggests that rules are always incomplete and can therefore not be followed to the letter. In other words, according to the former tradition of thought rules must always be respected, whereas the latter says they can never be followed. In the course of research carried out at a hospital, we encountered a contingent approach to rules. Distancing itself from the above views and their aim to make proposals with a universal scope, the management of CoRe Hospital (CoRe for Collaborative Research) considered that in certain cases strict compliance with rules was not only possible but also imperative. Was this point of view justified, and what were the implications for management? These were the questions behind the present research.

Adopting a contingent approach means that solutions are chosen depending on the characteristics of the situation. In the present case, this principle led us to envisage the existence of two types of rules: those that we define as complex because they are incomplete and must be interpreted, and those that we define as basic, which are required to be strictly respected. We

have distinguished these two types of rules according to four aspects: their terms (conflictual for complex rules vs consensual for basic rules), assessment criterion (legitimacy vs effectiveness), whether or not they are comprehensive for a competent actor, and systemic integration (high level vs low level). The aim of this distinction between two types of rules is not only to provide a theoretical basis for the behaviours observed, but also to reconcile two traditions of thought.

The study of three activities at the CoRe hospital (monitoring peripheral venous catheters (PVC¹), sorting healthcare waste and the costing of hospital stays) included three main phases. The first involved analysing breaches of rules that were required to be respected. To do so, in agreement with Reason (1993) we have distinguished deliberate breaches from errors, and have distinguished between different types of errors based on the Skill, Rule, Knowledge model developed by Rasmussen (1983). The following phases involved proposing actions and analysing their consequences. For this purpose, the conceptual frameworks taken from Reason (1993) and Rasmussen (1983) were completed and the actions were distinguished according to their preventive, recovery or mitigation function, and their level of innovation, distinguishing innovations from improvements, and their level of application (granularity) which may be that of the organisation, the man-machine interface or the individual. Whereas interventions carried out at the individual level have been widely discredited by studies of complex technological systems, our research shows their value when the relative simplicity of the situation makes it possible to formulate basic rules.

Based on the observations made before and after implementing our proposed actions, we suggest adopting an approach to managing breaches of basic rules which we describe as dialogical, to show that it involves two complementary and antagonistic aspects: an enabling aspect and a disciplinary aspect. Actions of the first type are intended to promote learning of the skills required and create the appropriate conditions for carrying out the activity. Disciplinary actions are intended to direct behaviour by means of a set of measures, of which sanctions only represent one aspect. The notion of dialogical management does not therefore involve the idea of dialogue (Tsoukas, 2009; Morin, et al., 2013); it involves a way of understanding complexity which, unlike Hegelian dialectics does not intend to go beyond radical contradictions, but attempts to understand the relationship between the terms of these contradictions, which is both complementary and antagonistic (Morin, 1980: 130; Morin, 2008: 17). Although the dialogics of enabling and restrictive action are not strictly speaking new (Giddens, 1987: 219), to our knowledge they are hardly represented in the managerial literature (Perrow, 1986: 26 and 36; Courpasson, 2000). The present research therefore makes it possible to apply at the organisational level the analyses carried out by Giddens (1987) from a social angle, and enhance our knowledge of the mechanisms involved in dialogical management of basic rules.

To carry out this research, we have adopted a collaborative management approach, defined as “an emergent and systematic inquiry process, embedded in an agreed-upon partnership between actors with an interest in influencing a certain system of action and researchers interested in understanding and explaining such systems” (Pasmore, et al., 2008: 13). The collaborative nature of this research is shown by defining objectives that must meet the expectations of both types of partners, and determining means that include in particular special access to information and employees at the hospital. It is also shown in the composition of the research team, which is a key element. The team included three “outside” researchers (lecturers at the Paris-Est University) who were present in the field on a weekly basis, and two “inside” researchers (a professor of medicine and a senior health executive) who were working full-time at the hospital. The composition of the team had a decisive impact on both the collection of data and the drawing up of our analyses. The managerial nature of

1. A full glossary of acronyms is provided in Appendix A.

the research is due to the fact that, among the different factors that influence the future of the system under study, special attention was given to the behaviour of managers, methods of management and organisational arrangements likely to improve the system's performance.

RULES, RELIABILITY AND ERROR: REVIEW OF THE LITERATURE

Radical criticism of prescriptions makes rules an obstacle to reliability, and the breaking of rules a necessity. Because it claims to have a general scope, radical criticism of prescriptions makes it impossible to envisage that in certain cases scrupulous compliance with rules may appear imperative. Firstly, we will show that such situations can exist, characterised by the application of rules which we describe as basic. We will then develop the idea that it is possible to establish a correspondence between the types of rules (complex vs basic) and the types of organisation (highly reliable organisations vs ultrasafe systems). Finally, we will indicate how we have used the work of Rasmussen (1983, 2000) and Reason (1993, 1997) to analyse errors, and more generally, breaches of rules.

RADICAL CRITICISM OF PRESCRIPTIONS PREVENTS US FROM ANALYSING SITUATIONS WHERE SCRUPULOUS COMPLIANCE WITH RULES IS NOT ONLY POSSIBLE, BUT IMPERATIVE

After presenting radical criticism of prescriptive intention, as it appears in occupational psychology and the sociology of organisations, we will show that this criticism, whose scope is certainly very wide, is excessive with regard to the ergonomic foundations that it cites. We will then put forward the idea that in certain cases it is possible to give comprehensive prescriptions to experienced operators. Unlike complex rules, such prescriptions, which we describe as basic rules, can be scrupulously respected by operators. Finally we criticise the argument according to which rules must be broken in order to improve them.

Radical criticism of prescriptive intention

The "scientific organisation of work" (Clot, 1995: 122) is seen as a symbolic illustration of the prescription of human conduct and constitutes the basis for criticism. An early example of this is found in Wallon (1947: 5): "Taylor's innovation, which he found quite natural and totally obvious, is to apply the same concern for precision and economy to human movements that is applied to the use of machines". Anticipating current criticisms, Wallon (1947: 6) emphasised Taylor's aim: "Once at work, workers must solely follow the instructions of their employer. Nothing would be more unfortunate than to allow them the slightest initiative". As has been shown by studies of ergonomics, this objective clearly becomes counter-productive "if it is necessary to monitor continuous production systems, when the work mainly involves anticipating, detecting, assessing and correcting incidents, the importance, type and number of which vary greatly" (Wisner, 1985: 3). Moreover, the work of Favergé (quoted by Wisner, 1985: 3) has shown that "the decision-making algorithms included in the technical system or provided in the form of instructions and intended to reduce these difficulties are suddenly unusable in situations that have been even slightly changed by a previous incident and that, in this case, a heuristic activity was required, which involved taking decisions according to non-formalised rules". If working situations are weighed down by incidents, organisational inconsistencies and unexpected events, it is not possible to carry out orders, as there is always a

discrepancy between the prescriptions and real life situations (Clot, 1995: 102; Dejours, 2003: 13; Friedberg, 1992; Girin & Grosjean, 1996: 5; Reynaud, 1993: 35). To avoid interrupting the activity, this discrepancy must be overcome, which can only be achieved by the human operator taking the initiative (Babeau & Chanlat, 2008; Linhart, 1994: 78). As a result, “working involves overcoming the difference between prescriptions and reality” (Dejours, 2003: 14), which means “following paths that lead away from the prescriptions”. “Since these prescriptions almost always have a normative nature, working well always involves breaches” (Dejours, 2003: 15), but “the prevailing attitude to management has not yet reached the stage of accepting the positive role of infringement” (Babeau & Chanlat, 2008: 203).

Excessive criticism with regard to the ergonomic basis that it claims

In an article in which they endeavour to compare the concepts of task and activity, Leplat and Hoc (1983) argue that a task refers to what must be done and includes the notion of prescription, whereas an activity refers to what it involves for the subject to carry out these prescriptions. They therefore define “a task as a given aim under determined conditions” (Leplat & Hoc, 1983: 51). The aim being “what must be done or more specifically, the final state” (Leplat & Hoc 1983: 51), they specify that it must be achieved in compliance with certain conditions regarding the states to be attained before reaching the final state, the operations acceptable to attain these states and the procedure to be implemented to do so. The prescribed task is designed by the person who orders its execution, and “pre-exists the activity that it aims to direct and determine more or less entirely” (Leplat & Hoc, 1983: 52-53). The description “provided always refers, implicitly or explicitly, to a subject with specific characteristics. What is explained in the description of the task corresponds to what is not supposed to be known about the subject” (Leplat & Hoc, 1983: 53). For a given subject, the description is seen as comprehensive “when it enables immediate performance of the task without further prior knowledge acquisition”. Such a task “therefore only requires performance by the subject, i.e. the implementation of a procedure that is already known” (Leplat & Hoc, 1983: 54).

According to Leplat and Hoc (1983), the prescribed task understood in this way does not involve any infringement in order to be properly carried out. The completeness of its definition is of course in no way absolute; it relates to “a certain model of the subject” and leaves numerous aspects of the implementation unspecified. It seems that this is the case whenever the description merely states the aim, which is to command attention and prevent any tasks being omitted. In hospitals, lots of tasks that are crucial for patient safety are of this kind, such as identifying patients and refusing to dispense drugs on the basis of handwritten or verbal prescriptions. In this instance, strictly speaking the subject model implied by this description of the prescribed task does not involve any restriction regarding the personnel concerned: even without experience a qualified nurse is able to understand and carry out the instructions.

The studies of skills by Dreyfus and Dreyfus (1986) applied by Frenette-Leclerc (1991) and Benner (2005) to paramedical staff make it possible to operationalise the notion of subject model. Dreyfus and Dreyfus (1986: 50) distinguish five levels of skills from novice to expert. In the case of paramedical staff, at the end of their studies nurses are usually at the second stage of the scale defined by Dreyfus and Dreyfus (1986), i.e. advanced beginners. They still need to gain experience to be able to apply, totally reliably and autonomously, the rules that they must respect. Once they have gained experience, they are seen as competent (Dreyfus & Dreyfus, 1986). In this article, we will use the term used at the hospital to describe this level of competence: “experienced staff”.

The possibility of giving comprehensive prescriptions leads us to look again at the question of error and infringement

As has been stated, numerous authors who rightly criticise Taylorism have maintained the existence of an inevitable discrepancy between the prescribed work and the real-life situation, and have asserted that it is necessary for the operator to intervene to overcome this (Linhart, 1994: 78; Clot, 1995; Dejours, 2003: 13; Terssac, 2012). It is possible to deduce from this analysis that “even if the work is well-designed and rigorously organised, and the instructions and procedures are clear, it is impossible to achieve quality by scrupulously respecting the prescriptions” (Dejours, 2003: 13). Once it has been accepted that scrupulous compliance with instructions is impossible, it is logical to assume that “working well always involves breaching rules” (Dejours, 2003: 15) and to maintain that “the limit between compliance with rules and breaking them is (not only) difficult to determine, but also... highly unrealistic” (Babeau & Chanlat, 2008: 209). Once infringement has been accepted as a necessary component of work well done, employees cannot escape the dilemma of either blocking the system by complying too scrupulously with prescriptions, or running the risk of being accused of indiscipline, incompetence or error in the event of an incident (Dejours, 2003: 16-17). Although they are based on substantial empirical evidence, these proposals do not apply to cases where it is possible to give comprehensive prescriptions as defined by Leplat & Hoc (1983). In this type of situation, compliance with rules, errors and infringement are likely to be defined clearly and precisely. This is shown in the section devoted to the analytical framework based on the work of Reason (1993, 1997) and Rasmussen (1983).

A typology of rules likely to reconcile the critical tradition with managerial practice

Starting with the premise that the critical tradition presented above does not have the universal scope that it claims, in the present section we attempt to specify its area of application. Alongside the complex rules of the critical tradition, we therefore distinguish basic rules which it is possible to expect competent actors to strictly respect. To demonstrate the different types of rules, two examples have been provided from the French Highway Code: the first is analysed by Reynaud (1993) and concerns speed limits, and the other concerns stop signs.

Regarding the maximum speed limit of 90 km/h on major roads in dry weather, Reynaud (1993: 35-36) is forced to identify the actual rule, behind the declared rule. In this connection he states that drivers rarely comply with the rule and the police force applies it in a way that can vary according to circumstances. Reynaud (1993: 36) concludes that there is “a common core in different people’s understanding, but that it is quite vague (you must not drive too fast) and that there is substantial disagreement about the circumstances in which it is possible to make an exception”. He adds that “the rule in force does not exist as an observable datum. It is a form of compromise or rather a no man’s land between what the authorities want to impose and what the users accept”.

We will now look at the second example: stop signs. Article R415-6A of the French Highway Code stipulates that at “intersections marked by a stop sign, all drivers must stop before entering the intersection. They must give way to vehicles driving on the other road(s) and only enter the intersection after making sure that it is not dangerous to do so. Any driver who infringes the provisions of the present Article shall be punished...” The law does not indicate any minimum duration, but it is essential for the vehicle to actually stop, so that the driver has the time to decide whether he can enter the intersection, depending on the traffic and rules regarding priority.

The rules governing speed and stopping at intersections have distinct characteristics. Breaking the speed limit for a road by three or four kilometres an hour does not significantly increase the risk of having an accident, or its

seriousness. Moreover, the authority with the power to impose sanctions can state that it does not punish people who break the limit while overtaking since, by reducing the time required to overtake they can help to improve safety (Reynaud, 1993: 36). The vagueness surrounding speed limits does not exist regarding stop signs: in this case it is essential to stop, as is borne out by the statistics. According to the road accident figures for 2012 drawn up by the French National Interministerial Observatory for Road Safety (2013), failure to respect rules regarding priority (not stopping at traffic lights or a stop sign) is the main cause of fatal accidents.

We will try to show the specific nature of rules such as the one regarding stop signs, before comparing them with those discussed by the critical tradition. Firstly, this rule originates in the pursuit of social welfare and not in the confrontation of social groups with differing interests. For this reason we describe it as consensual. This does not mean that the rule will be applied, but only that there is no debate regarding the rule's definition. Actors can therefore question whether it is their duty to carry out a task, for example the costing of hospital stays, without challenging the coding rules. Secondly, the rule is effective, as is shown by the road accident statistics. It is necessary to comply with the rule to reduce the accident rate. Thirdly, knowledge of the rule is sufficient for a driver who has just obtained his driving licence to be able to respect it rigorously under all circumstances. As such it can therefore be described as comprehensive. Fourthly, this rule is an autonomous part of the system which must be taken into account, if you wish to reduce road safety risks (Rasmussen & Svedung, 2000: 24). This means that it is only loosely linked to the rest of the system (Weick, 1979: 111). Consequently, unlike what happens in tightly coupled systems according to the "Normal Accident Theory" (Perrow, 1984), the difficulties are not the same when predicting the effects of changes to the rule on the general balance of the system it belongs to.

We therefore describe as basic a rule that, like the rule regarding stop signs, is consensual, effective with regard to the objective pursued, comprehensive from the point of view of the actors who must apply it, and which appears as an autonomous component of the system which must be considered in order to deal with all aspects of the problem that justifies the rule. Table 1 compares this type of rule with the type referred to by supporters of the critical tradition.

Table 1. Two types of rules: basic and complex

Dimension	Type of rule	Basic	Complex
Terms		Consensual	Conflictual
Assessment criterion		Effectiveness	Legitimacy
Condition of applicability		Comprehensive	Not comprehensive
Systemic integration		Autonomous	Interdependent

The present research was conducted due to the difference of opinion between practitioners and researchers regarding the possibility of requiring certain rules to be scrupulously respected. Table 1 suggests that this disagreement could be resolved by distinguishing between complex and basic rules. However, given that a basic rule has been identified in a situation without any organisational context, that of driving cars, it may be asked whether basic rules can exist in an organisational environment. One of the objectives of the empirical research presented in the next part of this article is to answer this question.

Infringement of rules is not a necessary condition for improving them

The analysis by Leplat and Hoc (1983) shows that if prescriptions are comprehensive, they do not at all need to be infringed in order to carry out the task. However this analysis does not answer the question of whether infringement can help to improve rules, as is suggested by Alter (2002: 28). The example of stop signs shows that there are rules which are not in any way improved by being infringed. But what about the tasks that are the subject of the present research? According to Tsoukas and Chia, (2002: 573) organisations are both: “a given structure (i.e., a set of established generic cognitive categories) and an emergent pattern (i.e., the constant adaptation of those categories to local circumstances)”. They are, according to Tenkasi and Boland (1993, cited by Tsoukas & Chia, 2002: 576) “in a state of perpetual becoming because situated action within them is inherently creative”. It follows that the “categories and practices are potentially on the verge of turning into something different for new experiences to be accommodated” (Tsoukas & Chia, 2002: 576). The analysis by Tsoukas and Chia clearly applies to a large number of situations. However, the question remains whether, regarding the tasks studied in this article, infringements can help to improve the categorisation framework that they use. This question will be answered in the discussion.

ORGANISATIONS AS A GUARANTEE OF RELIABILITY

Whereas the critical tradition regarding rules tends to argue that reliability must be obtained in spite of the organisation, the idea that organisations can be a factor affecting reliability has resulted in two separate approaches based on the notions of high reliability and ultra-safety. The first approach is inspired by interactionism and is provided by the High Reliability Organizations (HRO) movement. In their work on managing the unexpected, Weick and Sutcliffe (2001) discuss the question of reliability in healthcare institutions on several occasions. They consider that patient safety depends to a large extent on the quality of the interactions between the members, in particular the doctors and nurses (Weick & Sutcliffe; 2001: 58, 76), and state that this quality is the result of interactions that are attentive (Weick & Roberts, 1993) and respectful to the interlocutor (Weick, 1993). Although it is interesting, the interactionist approach is above all concerned with sensemaking by actors faced with ambiguous situations, and does not correspond to the problem posed by compliance with basic rules, which we have seen are anything but ambiguous. As is suggested by Amalberti et al. (2005), it is probably necessary to distinguish two types of situations in hospitals. The HRO approach applies effectively in situations where the ambition, audacity, and aggressive efforts to rescue patients involve considerable risk taking. On the other hand, in situations where there is no ambiguity, it appears more appropriate to aim for the “ultra-safety” typical of activities such as air and rail transport where the probability of a disaster by exposure to risks is less than 1×10^{-6} . Table 2 is taken from Amalberti et al. (2005), and indicates how the notions of ultra-safety and high reliability can be applied to hospitals.

Table 2. Types of hospital safety systems (from Amalberti et al., 2005)

Category	Type of System	
	Ultrasafe System	High-Reliability Organization
Example of industry	Commercial aviation, anesthesiology, radiotherapy, blood transfusion	Chemical production, Intensive care unit, surgical ward
Goals	Safety first Quality of work preserved against unacceptable pressure	Production first (imposed) Degree of safety as high as possible in view of the imposed level of performance
Safety level (in terms of risk per exposure)	Better than 1x10 ⁻⁵ , possibly 1x10 ⁻⁶	Better than 1x10 ⁻⁴
Complexity of expertise required	Limited complexity Actors are requested to follow procedure Equivalent actors	Potentially severe complexity Abnormal cases are challenging Reluctance to simplify Deference to expertise of individual experts
Situational awareness	Inside (team) and outside supervision	Inside supervision and mutual control (team supervision)
Teamwork	Effective teamwork and communication, resulting in good task sharing, controls and collective routines	Effective teamwork and communication, with special attention to safe adaptation to the range of individual experts

Basic rules can exist in activities belonging to the ultrasafe model as well as in those belonging to the high reliability model. However, if we look at the principles governing the rules on the one hand, and the models on the other, we can see a correspondence between the principles governing ultra-safety (single goal, simplicity of the activity, requirement to comply with rules) and those that apply to basic rules. There is the same type of correspondence between the principles of high reliability (need to decide between contradictory goals, complexity of the activity, difficulty making sense of the situations encountered) and those attached to complex rules. This conclusion is not surprising. Indeed, the tasks studied in the present research comprise nothing unexpected and an experienced member does not need to interact with other members in order to carry them out. Conversely, the ability to manage the unexpected, which is central to the interactionist approach to high reliability, is based on the quality of the reciprocal listening and exchanges between the members. The ultrasafe model gives central importance to compliance with rules, and consequently to threats to compliance: infringements and human errors. Our interest in the latter echoes the surprise of Amalberti et al. (2005) regarding the lack of effort made in hospitals to reduce their occurrence, although there are few high-risk sectors where there are so many obvious sources of human error.

BREACH OF RULES: CONTRIBUTION OF PREVIOUS WORKS

This section is based on the works of Reason (1993, 1997), and firstly presents the notions of errors and deliberate breaches. It then discusses the skills, rules and knowledge (SRK) model developed by Rasmussen (1983, 2000) which will be applied in the error analysis.

Distinction between errors and deliberate breaches

Reason (1993: 30-32) uses the term error to refer to all cases where a planned sequence of mental or physical activities does not achieve the planned result, although no unforeseeable event has occurred. An error can be a planning defect (mistake) or a performance defect (Lapse or slip). A mistake is the result of a defect in the judgement and/or inference processes involved in choosing an objective or specifying the means for achieving it. Lapses and slips are the result

of a defect in the performance and/or storage of a sequence of actions, regardless of the quality of the plan governing them.

Violations are breaches of procedures, standards or safety regulations; they may be deliberate (as is generally the case when a driver crosses a continuous line separating traffic lanes) or involuntary (when a driver breaks a speed limit that he is unaware of). Unintentional violations are the result of an error (Reason, 1997: 72) and therefore require no further comment, unlike deliberate breaches which we refer to in this article as infringements. The intentional nature of infringements does not involve the malicious intent that characterises sabotage (Reason, 1997: 72). A deliberate violation has three main motives: to manage to do the work in spite of the obstacle posed by the rule, to experience the pleasure of infringement or to save effort (Reason, 1997: 73). The first two motives were not observed in the cases we studied. On the other hand, our observations do not allow us to rule out a desire to save effort, which we refer to as negligence. Finally, we have decided to include resistance in our analysis due to the observations made, although Reason (1997) does not include it as one of the main motives for intentional violation. .

The different levels of cognitive control involved in errors

The way individuals carry out the tasks within their remit depends on their familiarity with them, and the errors that they are inclined to commit vary accordingly. The skills, rules and knowledge model developed by Rasmussen (1983) shows the diversity of the cognitive control mechanisms that individuals use to deal with the situations that they encounter. As cognitive control becomes less automatic the process becomes less fluid, requires more time and is more prone to error.

Behaviour based on automatic reflexes involves sensorimotor execution which, following the expression of an intention, takes place without conscious control in the form of fluid, automatic and highly integrated behaviour patterns. At this level, errors have the form of omissions or behaviour that is consistent but inappropriate.

In the case of behaviour based on rules, control is based on a memorized rule such as "For this diagnosis, carry out this type of action". At this level of cognitive control, errors generally result from incorrect classifications leading to the application of incorrect rules. Consequently, an individual who follows a routine automatically does so without paying conscious attention to it and is unable to say how he controls execution of it and what information he relies on. Conversely, behaviour based on rules is generally based on explicit know-how and the individual is able to state the rules applied.

When an individual faces a new situation for which he does not have any know-how or rules, control of execution must rely on assumptions based on the mental representation of the causal structure of the system within which he acts (Rasmussen, 2000: 62). At this level, errors are due to the limits of individual rationality and the incomplete or inaccurate nature of the knowledge applied, making it possible to distinguish between novices and experts.

Since the differences between these three types of control do not prevent them from being used at the same time (Reason, 1993: 74), the distinction between novices and experts is generally apparent in activities based on automatic reflexes and rules. Experts have a large number of routines suitable for dealing with a wide variety of possibilities, unlike novices who are more likely to commit errors (Reason, 1993: 90-95).

In short, previous works and our observations make it possible to distinguish errors from deliberate violations. The latter may be the result of negligence or resistance by people who apply rules. Errors are the result of behaviour based on automatic reflexes, rules or knowledge. All of these breaches

of rules are presented in the table analysing the three case studies of this research.

CHOICE OF A COLLABORATIVE APPROACH AND ITS METHODOLOGICAL IMPLICATIONS

COLLABORATIVE MANAGEMENT RESEARCH

Pasmore et al. (2008: 13) define collaborative management research as “an emergent and systematic inquiry process, embedded in an agreed-upon partnership between actors with an interest in influencing a certain system of action and researchers interested in understanding and explaining such systems”. They complete this definition with four points. Firstly, the parties to the project include at least one member of the organisation or system under study and at least one external researcher. Secondly, the managerial character of the research stems from the attention given to the behaviour of managers, the methods of management and the organisational arrangements. Thirdly, the inquiry uses scientific methods supposed to reduce the risk of making incorrect inferences based on the data collected. Finally, the aim of the approach is to improve the performance of the system and contribute to the body of knowledge in the field of management (Pasmore, et al., 2008: 20). The present research is wholly in line with the collaborative management approach described by Pasmore et al. (2008): it is based on a partnership between the members of an organisation, concerned by failure to comply with certain rules, and university researchers wishing to address this concern by improving knowledge of the use of rules in management situations (Girin, 1983).

Without going into detail, it is possible to position collaborative management research in relation to action research and participatory action research. It should be noted that all of these approaches: a) combine the characteristics of “inquiry from the outside” with those of “inquiry from the inside” (Evered & Louis, 1981); b) they share the conviction that producing knowledge and action are not two separate processes; c) finally, they are based on the principle that outside and inside members work together and learn by using methods with a scientific basis (Pasmore, et al., 2008: 21).

Compared with the aforementioned approaches, collaborative management research is characterised by the importance given to managerial aspects and the efforts made to understand the influence of the behaviour, actions and tools supposed to bring the system to the required final state. In comparison, action research has covered a much wider area in the field of social science, as is shown by the research of Lewin (1946). For its part, action science (Argyris, 1995; Argyris & Schön, 1989), explores the ways and means that enable individuals and organisations to move from model I behaviour based on defensive routines to model II behaviour where their disappearance enables learning. Finally, participatory action research (Whyte, 1991), is distinguished by the idea that understanding behaviour at work involves incorporating social and technical factors (Trist, 1981) and by the importance that it gives to members at the bottom of the hierarchy (Whyte, 1991: 10-12).

DESIGN, RESEARCH PROCESS AND DATA COLLECTED: THE INFLUENCE OF THE COLLABORATIVE AND MANAGERIAL NATURE OF THE INQUIRY

The collaborative and managerial nature of the research has had a considerable impact on the design, collection and drawing up of the data.

Design: result of the discussion of imposed cases

Even though the tasks concerned by non-compliance with rules appeared simple, it soon appeared to us that there were numerous mechanisms underlying the phenomena under study and they were rather complex. Moreover, since we were unable to control these phenomena, but were able to access the protagonists relatively easily, carrying out case studies appeared to us to be an appropriate method (Yin, 1984:17). The choice of cases was partly imposed by the collaborative nature of this research; the question arose however of whether it was necessary to broaden the sample. The cases proposed offered several advantages. Firstly, they had enough characteristics in common to allow comparison: tasks controlled by rules decreed by outside bodies with national jurisdiction, and sufficiently simple to be understood by the outside members of the team. There were also interesting differences between these tasks: they concerned the medical sector (coding of diagnoses and interventions and sorting of waste), paramedical sector (supervision of PVCs and sorting of waste) and were located at varying distances from the healthcare activity that is central to the hospital's mission. In addition to increasing the team's workload, broadening the sample involved questioning more informants about topics that were necessarily less important in the management's opinion. Since there were no clear arguments in favour of broadening it, our research concerned the three cases initially planned.

Influence of the collaborative nature of the project on access to information and how it is processed

Our team included outside researchers who were present in the field on a weekly basis, and inside researchers who held a full-time job at the hospital. In line with the definition by Pasmore et al. (2008), this composition of the team had a decisive impact on both the collection of data and the drawing up of our analyses.

Privileged access to information

The data collection system implemented in this research involved three of the four types of triangulation identified by Denzin (1970): 1) data triangulation was carried out by increasing the number of informants and secondary sources (audits, statistics, minutes of meetings, internal and external documents relating to regulatory provisions); 2) investigator triangulation was carried out by using outside and inside members to collect and interpret the data; 3) we used several techniques for collecting primary data (interviews, participation in meetings, observation). Due to the relative simplicity of the subjects studied, we did not face any significant weaknesses that we were not able to overcome while collecting the data.

The case studies were drawn up on the basis of a limited number of objectives: a) provide a reliable description of the actual task (i.e. what an experienced operator actually does under nominal conditions); b) indicate the rule(s) governing performance of the task; c) provide concrete examples to identify the different types of errors and infringements of rules; d) assess the effects of this behaviour on the functioning of the hospital, the risks incurred and financial implications, and e) identify the initiatives introduced within the establishment to limit these errors and/or correct them. These objectives guided the collection of both primary and secondary data.

The involvement of inside members gave data collection a specific nature, in terms of the information looked for intentionally, and data obtained that was not originally looked for. Regarding the intentional collection of information, the inside members did not carry out any planned interviews, but on the other hand throughout the project they were guided by the objectives specified above and were able to take advantage of the opportunities provided by their work to collect

the information required. Regarding data obtained that was not originally looked for, Miles and Huberman (2003: 129) stress the importance for field inquiries of input carried out on the fly, in the corridor or at a meeting. They may incidentally provide information that is looked for but difficult to obtain; they may also provide anecdotes, comments or impressions that make it possible to complete the interpretations obtained at planned interviews. Although this type of data collection exists in all field inquiries, the sustained involvement of two inside members in the work of the research team considerably increased the number of opportunities for it.

Formatting central to interactive development

Miles and Huberman (2003: 101) suggest that the data should be analysed during the collection process. We followed this recommendation, taking advantage of the data collection operations to submit some of our analyses to our informants, and using plenary meetings, the main aim of which was to discuss the interpretation of the data, in order to extend the collection of information.

Although overlapping of the collection and analysis phases is usual for in-depth inquiries, the process for drawing up the analyses was heavily influenced by the composition of our team. Although the inside members played an active role in all of the stages of the research, the successive formatting (Miles & Huberman, 2003: 499) of our analyses was carried solely by the outside researchers. Tables 5 and 6 are typical of this formatting. Discussions between the two components of the team mainly concerned this aspect. There are two reasons for this. Firstly, the fact that they did not take part in drawing up the formats probably enabled the inside researchers to see them with a fresh eye and discuss them more incisively than would have been the case if they had been more involved in their creation. Secondly, the formatting process probably contributed to the quality of the discussions. It is much more difficult to organise a discussion about a text than about a synoptic system (Miles & Huberman, 2003: 276). Taken together, the alternation between phases of work in a small group and work in a plenary group, and the use of formats suited to discussion certainly favoured the interactive nature of the plenary meetings and helped to enrich the discussions.

Two data collection phases: to make proposals and assess their effects

Data collection was carried out in two phases, firstly during the phase when actions were proposed, and secondly during observation of the consequences of the proposals. Tables 3 and 4 present the primary data collected during each of these phases; the secondary data is presented in Appendix B (Tables B1 and B2). Primary data was collected in three different situations: meetings, interviews and observations. At least one of the members of the research team took part in all management meetings at which one of the tasks under study was included on the agenda. Planned semi-structured interviews were carried out by two outside researchers. As a precaution, the interviews were all recorded, but were not retranscribed since the collection of information was restricted. The recordings were only used on rare occasions when the notes taken by the researchers were different or ambiguous. Two types of observations were made. Observations by inside researchers are highly recommended by Balogun *et al.* (2003) and were continuously made due to their daily presence in the establishment. Two outside members underwent one week of immersion, one in a medical department and the other in a surgical department, in order to familiarise themselves with the organisation of the departments, professional practices and labour relations. Table 3 presents the different situations for collecting the primary data used to make proposals for action. Table 4 shows the data collection situations for following up the proposals made, the action taken and its effects.

Tableau 3. Collection of the primary data used to support proposed action

Collection situations ²	Date and duration	Case
<i>Management meeting</i>		
- Management meeting	- 17 May 2011 (4.5 hours)	All cases
- Hospital medical committee (CME)	- 22 June 2011 (2 hours)	
<i>Meetings of the research team</i>		
- Plenary meetings of the research team (inside and outside researchers)	- 39 meetings (2-3 hours)	All cases
- Meetings of outside researchers	- 31 meetings (1-3 hours)	
<i>Individual or group interviews</i>		
<i>Informants:</i>		
- Chief medical information officer (CMIO)	- 16 January 2012 (telephone 30 minutes), 18 January 2012 (90 minutes), 23 January 2012 (2 hours), 2 February 2012 (telephone 1 hour)	Coding of diagnoses and interventions
- Doctors required to code	- 17 December 2012 (2 hours), 27 February 2014 (45 minutes), 19 March 2014 (90 minutes)	
<i>Meeting:</i>		
- Management meeting	-14 June (4.5 hours)	
<i>Individual or group interviews</i>		
<i>Informants:</i>		
- Department managers and nurses	- 24 December 2011 (telephone 30 minutes)	Sorting of waste
- Head of the waste management study	- 13 January 2012 (90 minutes)	
- Head of the quality-safety unit	- 20 January 2012 (1 hour)	
<i>Meetings:</i>		
- Logistics department meetings	- 24 May 2011 (4 hours), 21 June (4 hours)	
- Hospital management committee (CSE)	- 15 February 2012 (2 hours)	
<i>Individual or group interviews</i>		
<i>Informants:</i>		
- Referent nurse and senior executives	- 25 May 2011 (90 minutes) - 29 December 2011 (1 hour), 6 June 2012 (telephone 30 minutes), 27 June 2012 (1 hour)	Phlebitis
<i>Meetings:</i>		
- Inside researcher and nurses	- 18 August, 9 September and 11 October 2011	
- Management meeting (all of the team)	- 14 June 2011 (4.5 hours), 21 June (4 hours)	
<i>Observations</i>		
- Observations of the outside members and related discussions	- Two immersions, one in medicine, the other in surgery, carried out in spring 2011	All cases
- Observations of the inside members and related discussions	- Continuously from September 2011 to June 2012	

2. In connection with the project concerning the current organisational transformation, the inside members took part in many other meetings that did not concern the cases studied, but which provided interesting information regarding the context.

Table 4. Collection of primary data concerning the follow-up of the proposals made, the action taken and their effects

Collection situations ³	Date, duration and subject	Situation
<i>Plenary meeting of the team</i>	18 Dec. 2014 (90 minutes) discussion of Table 6	All cases
<i>Group interview</i> - CMIO and one MIT*	2 Dec. 2014 (2 hours): subject: follow-up of the proposals made, action taken and its effects	Coding of diagnoses and interventions
<i>Individual interview</i> SRN Public Health Nurse	31 October 2014 (2,5 hours) subject: follow-up of the proposals made, action taken and its effects	Sorting of waste
<i>Data from observation and meetings of the inside senior executive with the operators concerned:</i> executives, SRN**, nursing auxiliaries	Autumn 2014 subject: follow-up of the proposals made, action taken and its effects	
<i>Individual interview</i> Healthcare executive	19 November 2014 (2 hours) subject: follow-up of the proposals made, action taken and its effects	Phlebitis
<i>Data from observation and meetings of the inside senior executive with the operators concerned:</i> executives, SRN, nursing auxiliaries	Autumn 2014 subject: follow-up of the proposals made, action taken and its effects	

* CMIO: doctor, chief medical information officer; MIT: Medical information technician.

** SRN: state registered nurse.

OVERVIEW OF THE THREE TASKS STUDIED

The establishment where the research was conducted has a capacity of over 300 beds and is considered to be a large hospital in Ile de France (DREES, 2013: 85). It employs about a thousand people, two-thirds of whom are paramedical staff. It is a short stay medical, surgical and psychiatric hospital for adults. The tasks studied there, monitoring of PVCs⁴, sorting of healthcare waste and coding of diagnoses and interventions, are subject to the same constraints as in any other hospital. There is no operational link between them, and they are very different from each other in their relation to healthcare and in the role played by doctors and nurses. All they have in common is that until then, the efforts made to achieve compliance with the prescriptions concerning them only had limited and temporary effects.

SORTING OF HEALTHCARE WASTE

As well as non-specific waste (batteries, bulbs, toner), due to their healthcare activity hospitals produce various kinds of waste: drugs, radioactive waste, radiographs etc. Waste management is the subject of extensive regulation, answering economic, environmental and risk prevention concerns (Meah, 2008b). In view of these constraints, waste management in a hospital can be complicated and tools are made available to establishments to help them with this task (ANAP, 2008, 2010); on the other hand, the sorting of healthcare waste carried out within departments appears relatively simple. The data available shows that a short training course makes it possible to acquire the skill required to systematically carry out compliant sorting. This is organised in three levels.

3. In connection with the project concerning the current organisational transformation, the inside members took part in many other meetings that did not concern the cases studied, but which provided interesting information regarding the context.

4. This article only deals with peripheral venous catheters, not central venous catheters or arterial lines.

5. Some CW does not come from healthcare activities, but from activities such as catering. In the rest of this article, the CW studied is healthcare waste.

The first involves identifying recyclable waste, such as reusable sheets. The second is based on the difference between consumer waste (CW⁵) and infectious clinical waste (ICW⁶). The third level in the category structure involves choosing the appropriate container (box, bag or barrel) for infectious clinical waste. ICW constitutes a health hazard when it is incorrectly packaged, whereas putting CW into packaging reserved for ICW leads to unnecessarily expensive treatment. Once sorting errors have been made they are generally difficult to recover, regardless of the type. Most waste is bagged in the patient rooms: recovery by a third person is unlikely in this case. On the other hand, when waste processing is carried out in the ward, errors, such as overfilling a box of needles, can be recovered by another nurse. When we conducted our research, the waste system had just been reorganised and the storage conditions had been brought into compliance with standards. However, the quality of sorting remained unsatisfactory. In spite of favourable conditions, awareness campaigns and training of the staff, the nonconformity rate remained high, although highly variable depending on the department.

MONITORING OF PERIPHERAL VENOUS CATHETERS

Peripheral venous catheters (PVC) are a sterile medical device introduced percutaneously in a superficial vein, and are very often used in the hospital⁶. They can cause inflammation (phlebitis) of medicinal, mechanical or pathogenic origin. According to a study carried out in 2001, 0.67% of patients with peripheral venous catheters suffered infections linked to the catheter (SFHH – HAS, 2005). In the event of infection the complications can be serious if they are not treated in time. Monitoring of PVCs was on the agenda for the meeting of the CoRe hospital management in June 2011 after a doctor observed patients in his department with severe inflammations on several occasions, and a morbidity and mortality review showed that a patient had been admitted to the intensive care unit due to complications from poorly monitored phlebitis. Following this serious adverse event, a working party was formed with the task of controlling the problem.

One of the measures taken by the group, which one of the members of our team took part in, involved providing nurses with a decision-making tool: the so-called amended Maddox scale (Wiedenkeller, et al., 2010). The scale provides a summary of observations of clinical signs at the PVC insertion site, such as pain, erythema, swelling, purulence etc. This summary takes the form of a grade from 0 to 5. For each grade the scale indicates the action to be taken by the nursing staff. For example, a painful intravenous site with erythema and slight swelling or a palpable venous cord corresponds to grade 3. In this case the nurse must “remove the PVC, put the point of the PVC in a culture medium, apply an alcohol-based dressing, change it 2-3 times per day until the clinical signs disappear and inform the doctor”.

The amended scale adds four other grades corresponding to specific incidents, for example if the patient tears off the PVC, for each of which the scale provides instructions, in this case stipulating application of a suitable dressing. Due to its simplicity, it was possible to successfully introduce this tool within one month in the establishment chosen for the experiment conducted by Wiedenkeller et al. (2010)⁷. Similar support was provided for introduction of the tool at the CoRe hospital. Although it was not possible to provide traceability of records due to the reluctance of staff who claimed that the computer system was too onerous and it would waste time, the manager considered that the method was well mastered by the nurses. In spite of the efforts made during the summer, several breaches of prescriptions were observed in autumn 2011.

6. 18% of patients hospitalised for over 24 hours have a peripheral venous catheter (SFHH – HAS, 2005) according to the national survey of the prevalence of hospital-acquired infections conducted in France in 2001.

7. During the next three months, the nursing staff was supported daily by the public health nurse and an audit was carried out of 365 PVC. The clinical assessments of the nurse and the public health nurse agreed in 83% of cases, the protocol for changing PVCs was respected in 98% of cases and traceability of the record was provided in 97% of cases.

CODING OF DIAGNOSES AND INTERVENTIONS

French hospitals are financed by health insurance according to activities valued by means of the costing of hospital stays. The prices are controlled by coding rules included in the methodological guide to producing healthcare information. This guide was drawn up in connection with the information systems medicalization programme (PMSI) and published by decree of the French ministry of labour, employment and health, and regularly updated. Coding concerns the diagnoses and tracer interventions which may be carried out by different departments. The so-called tracer interventions make it possible to cost the stay, and are linked to the primary diagnosis, which refers to the health problem that led the patient to admission. Each tracer intervention has a code; determining the code does not involve judgement and is not difficult if the coder masters the software and knows where to easily find the codes he needs. However, an untrained doctor may have difficulty finding the correct code, and in some cases may think he has the right code when in fact it is incorrect. Coding errors are liable to lead either to under-costing of the stay and therefore a loss of revenue, or over-costing which exposes the hospital to financial penalties during controls carried out by the health insurance funds.

At the CoRe hospital, the policy adopted involves putting doctors in charge of coding⁸. To avoid errors, the medical information department (MID) carries out awareness campaigns and provides training for departments where errors are most common and during changes of classification. In addition the CoRe hospital MID has a crucial role in recovering errors and omissions. Two points are of particular interest to it: medical departments identified as providing unreliable coding, and tracer interventions corresponding to surgical operations and technical support centre services, due to their importance in costing stays. There are two main methods of error recovery. The first involves identifying inconsistencies in the information provided by the departments, such as a surgical operation without anaesthetic. The second involves cross-checking information from departments for particularly expensive omissions. For example, for the surgical unit, this control involves reconciling coded interventions with the schedule for the unit. The errors identified are re-coded by the MID which informs the doctor responsible for the incorrect coding. In spite of the MID's actions, incorrect coding remains at an unsatisfactory level in the opinion of the MID and the hospital management, compared with the results of comparable establishments.

The tasks that have just been presented are relatively simple, compared with the complexity of surgical procedures (Amalberti, et al., 2005). Moreover they are governed by rules that meet the criteria specified above for basic rules: they are consensual, effective, comprehensive and autonomous. The presentation of the tasks shows that the notion of basic rules, developed using examples related to driving, also applies to organisational contexts such as hospitals.

COMPARATIVE ANALYSIS OF THE DELIBERATE VIOLATIONS AND ERRORS OBSERVED

Table 5 shows the various types of errors and deliberate violations which we were able to observe directly or which were reported to us as existing at the start of the research. In the case of monitoring of PVCs, the rules concern observation of the site and determining the action to be taken depending on the characteristics of the situation. Regarding healthcare waste, the rules make it possible to determine the category of the object concerned: recyclable, non-

8. Another option involves entrusting coding to the medical information department (MID). A trial was carried out with the intensive care unit, which proved unsuccessful: the patient records transmitted by the practitioners were incomplete and requests for additional information were generally ignored.

recyclable, ICW, CW, and the appropriate type of container. Costing of hospital stays is based on coding of diagnoses and interventions carried out during a given period, and problems may result from omissions, incorrect coding or assigning coded elements to the wrong stays. Comments are given for each task in the three right-hand columns of Table 5. The left-hand column distinguishes the deliberate violations (infringements) from errors, which it differentiates using the SRK model.

According to table 5, it appears that the three cases have different results when using the SRK model. Errors due to automatic reflexes are important for the monitoring of catheters and costing of hospital stays. Those based on rules arise in all three tasks, but in the case of the sorting of waste they only concern a very limited problem. Finally, it is only in the case of the coding of diagnoses and interventions that problems arise when cognitive control is applied to the knowledge base. If an operator does not know the code for an intervention, generally due to lack of experience, he can carry out a search by keyword. This may be complicated and time-consuming. For example, the coding software does not show any entries for the word "line" which is the term used for a catheter. As it is also only possible to enter a single keyword, a search using the word "catheter" provides over 300 results! The resulting increase in the coding time increases the risk that the task will be interrupted and coding omitted.

The organisational context also has a significant impact on coding errors, with omissions caused by interruptions and postponements. Coding is generally interrupted when the practitioner is required to carry out more urgent tasks. Coding may be postponed for various reasons: hardware, software or organisational reasons. Postponement is frequently caused by a lack of computers (e.g. in the surgical unit) or their unavailability (because they are shared between several users). The software package used only allows certain interventions to be input after others have been coded. Consequently, although the anaesthetist intervenes before the surgeon, the intervention can only be coded after that of the surgeon. A third cause of discontinuity in the coding sequence is organisational differentiation. The treatment prescribed by the doctor responsible for coding may have been only partly completed; it must therefore be coded once it is complete. The period of time between prescription and completion causes omissions.

Up to now, the cases have been seen as errors. However, several elements suggest that it is necessary to complete this approach by taking into account psychological factors unrelated to the issue of errors. For the sorting of waste, none of the sources of error included in the SRK model appears to have a significant role. This is because it is difficult in this instance to speak of error as it is defined by Reason (1993: 31), who uses the term to refer to cases where a planned sequence of activities does not achieve its purpose. In the case of non-compliant sorting, there is every reason to believe that the intention had been greatly weakened. The fact that the improvements observed were short-lived, following campaigns to raise the awareness of staff of the importance of sorting, suggests that nonconformities are the result of a negative attitude, rather than a failure of intention. This explanation is confirmed by informants who observed negligent attitudes foreign to the notion of error.

Table 5. Comparative analysis of errors and deliberate violations observed

Tasks	Monitoring of peripheral venous catheters	Sorting of healthcare waste	Coding of diagnoses and interventions
Errors based on			
Automatic reflexes			
	Failure to monitor the PVC intravenous site.	Disturbance of the attentional process has no specific importance.	Omission of interventions or the related diagnosis in the costing of hospital stays. The main causes of omissions are: <ul style="list-style-type: none"> • Interruption of coding due to the need to carry out a more urgent task. • Impossible to carry out coding in the place where the intervention is carried out, e.g. the surgical unit. • Fact that some interventions to be coded are not linked to the primary intervention (e.g. surgery) and were carried out by another practitioner (e.g. a nutritionist).
Rules			
• Incorrect interpretation of signs	Erythema at the intravenous site is not seen as such.	The signs are unambiguous.	The signs are unambiguous.
• Incorrect rule	The catheter is not changed for the (wrong) reason that the pain is not accompanied by any observable erythema. Certain symptoms were not taken into account for the (wrong) reason that they are generally unimportant. Decision to change the PVC (wrongly) abandoned due to intervention by the patient.	Soiled reusable linen put with ICW, although the cleaning system is wholly suitable and effective.	Division of a stay for the (wrong) reason that the patient left the hospital during his stay. Incorrect prioritisation of diagnoses leading to incorrect costing of the stay.
Knowledge			
	Monitoring of PVC intravenous sites is not a new situation for nurses, even if they are inexperienced. It is part of their initial training.	Sorting of waste is a familiar task, there are few rules and they are simple. They are taught during initial training.	Lack of knowledge of the codes a) increases the risk of errors b) significantly increases the coding time which increases the risk of interruption and therefore of omission.
Deliberate violations			
Negligence			
		CW put with ICW (leads to additional costs). ICW put with CW (Constitutes a health risk).	Coding devalued compared with care activity. Attitude strengthened by the existence of systematic control by the MID.
	<i>due to lack of attention given to a task considered important</i>		
Resistance	Unlikely.	Failure by a department to use CW containers.	Possible, because costing imposes economic constraints on treatment which some consider excessive.

* Non-problematical situations are in grey.

** This assessment is not supported by any observations, but this phenomenon has been observed in other hospitals (Bras, et al., 2012).

Analysis of these accounts led us to distinguish two types of negligence: the first involves considering the task to be carried out as unimportant, the second gives insufficient attention to a task that is nevertheless seen as important. Negligence by devaluation of the task is found among certain nurses who consider that tasks such as the sorting of waste, take up time that should be devoted to the patients. This attitude is typical of staff who are not very concerned by the financial aspects of the hospital's activities, and is conducive to nonconformities that simply generate costs⁹. Although it cannot be wholly excluded, negligence by devaluation of the task is an unlikely explanation when the well-being of patients is at stake or if there is a health risk, as is the case when ICW is incorrectly packaged. In this case, the infringement of professional rules is based on a lack of attention given to a task deemed important.

Whereas negligence is an attitude that favours the viewpoint of the individual, resistance is a political attitude based on an understanding of collective well-being. Unlike negligence, resistance can be asserted or at least displayed, like the healthcare department that temporarily classifies all its waste as ICW.

PRESENTATION OF THE ACTIONS PROPOSED AND THE RESULTS OBTAINED

The actions designed by our team to remedy breaches of rules and the results achieved are presented in Table 6.

CHARACTERISATION OF THE ACTIONS PROPOSED

The actions proposed can be distinguished by several aspects: their function in the safety system, their level of innovation and their granularity.

The three functions of in-depth defence

Measures intended to ensure the safety of activities and organisations can have preventive, recovery and mitigation functions. These functions are arranged in a series where each one is responsible for offsetting the failure of the preceding one.

Table 6 is organised vertically according to these three functions. Preventive measures for errors are presented according to the SRK model. Although all three functions exist in each of the actions presented, they are not present in each case studied. It may be noted therefore that recovery and mitigation measures only exist in the case of monitoring of PVCs. This is also the only task where it appeared pertinent to improve the ability of staff to decide between contradictory requirements.

Level of innovation of the action

Improvements involve systematizing actions that exist in certain parts of the hospital, or improving the methods of intervention of the managers. Innovations aim to introduce methods of functioning which, although they are new to the hospital, may have been tested in other establishments. Our proposals for waste management are based therefore on the study published by the ANAP in 2010; for coding problems they are based on the study published by Meah (2008a) and for monitoring PVCs on the study by Wiedenkiller et al. (2010).

9. Omission of coding, CW included with ICW.

Table 6. Follow-up to the suggestions made and results of the actions implemented

DEFENCE	Subject	Monitoring of peripheral venous catheters (PVC)	Sorting of healthcare waste	Coding of diagnoses and interventions
PREVENTION				
• Errors				
Automatic reflexes	Failure to monitor the intravenous site. Innovation introduced at the organisational level: association of monitoring of catheters with control of vital signs. Result: significant and lasting improvement.	Disturbance of attentional processes has no specific importance.		Omission of interventions. Innovation introduced at the man-machine interface: IT equipment enabling coding near to the place where the intervention is carried out. Result: no significant observable impact. Improvement introduced at the dyadic level: STBCF by the MID during unit committee meetings. Result: positive impact, but short-lived according to the CMIO. Innovation proposed at the organisational level: remove the rule requiring the surgeon to code before the anaesthetist. Result: technical obstacle to implementation.
Rules				
Incorrect interpretation of signs	Erythema at the intravenous site is not seen as such. Improvement introduced at the dyadic level with the local manager: STBCF and revision of know-how ; responsibility for the action is given to the referent nurse. Result: the observations of the inside member make it possible to conclude that there was a significant improvement.	<i>The signs are unambiguous.</i>		The signs are unambiguous.
Incorrect rule	The catheter is not changed for the (wrong) reason that the pain felt is not accompanied by any observable erythema and the ordinary symptoms need not be taken into account. Improvement introduced at the dyadic level: same as the above cell. Result: same as the above cell.	Soiled reusable linen put with ICW Improvements proposed at the dyadic level: • STBCF. Result: the action was not implemented due to the unavailability of the local manager and the fact that the problem was deemed not to be a priority. • Revision of know-how by the managerial staff. Result: this action was not implemented for the same reasons, although it was requested by the management.	Division of a stay for the (wrong) reason that the patient left the hospital during the stay. Improvement introduced at the dyadic level: STBCF by the MID. Result: deterioration of coding due to opening of the short stay unit. Specific IT development made it possible to improve this type of error.	
	Decision to change the PVC (wrongly) abandoned due to intervention by the patient. Improvement introduced at the dyadic level: same as the above cell. Result: Same as the above cell.			Incorrect prioritisation of diagnoses. Improvement proposed at the dyadic level: STBCF by the MID Result: the action was not implemented, because it was deemed more effective to recover errors than to prevent them. Innovation introduced in the man-machine interface: development of a software aid for the coder. Result: the proposal was initially implemented and then abandoned, since it was deemed more effective to develop a software aid to facilitate error recovery by the MID.
Knowledge	No proposal.	No proposal.		Errors and omissions due to ignorance of the codes. Innovation introduced in the man-machine interface: development of a software aid for the coder. Result: the proposal was initially implemented and then abandoned, since it was deemed more effective to develop a software aid to facilitate error recovery by the MID.

Table 6. Follow-up to the suggestions made and results of the actions implemented (continued)

DEFENCE	Subject	Monitoring of peripheral venous catheters (PVC)	Sorting of healthcare waste	Coding of diagnoses and interventions
PREVENTION				
• Deliberate violations				
Negligence				
<i>by devaluation of the task</i>				
<i>due to lack of attention given to a task considered important</i>	<p>Non-compliant monitoring of the PVC.</p> <p>Innovation introduced at the dyadic level: intervention by the managerial staff to improve management of choices between contradictory requirements.</p> <p>Introduced at the dyadic level with the local manager, but then reassigned to the referent nurse.</p> <p>Result: the observations of the inside member make it possible to conclude that there was a significant improvement.</p>	<p>Abnormal rate of CW in ICW</p> <p>Organisational innovations proposed:</p> <ul style="list-style-type: none"> • Random but regular control of containers. • Systematization of constructive feedback with the managerial staff and assessment of it. • Taken into account in the collective assessment of performance with an impact on the budget in proportion to the cost of ICW. <p>Improvement proposed at the dyadic level: STBCF</p> <p>Result: none of these proposals (innovations and improvements) were implemented, since the resources required were used for other priorities.</p> <p>ICW disposed of with CW.</p> <p>Innovations proposed at the organizational level:</p> <ul style="list-style-type: none"> • Random but regular controls of containers. • Systematization of constructive feedback with the managerial staff and assessment of it. <p>Result: none of these proposals were implemented, since the resources required were used for other priorities.</p> <p>Improvement introduced at the dyadic level: STBCF</p> <p>The action was introduced with the local manager, then reassigned to the referent nurse and completed by a communications campaign (poster advertising in particular) by the public health nurse.</p> <p>Result: An audit showed mixed results: although it was reduced, the health risk still remains, whereas putting CW with ICW continues to put a strain on the hospital's budget.</p>	<p>Abnormal rate of non-compliant coding.</p> <p>Improvement introduced at the dyadic level: STBCF by the MID</p> <p>The action could only be carried out with the departments that requested it.</p> <p>Result: positive impact, but short-lived according to the CMIO.</p> <p>Innovation proposed at the individual level: taken into account in the appraisal</p> <p>Result: the action was not implemented due to its supposed lack of effectiveness.</p>	
Resistance	<p>No cases reported, so no proposals.</p>	<p>Abnormal rate of non-compliant sorting</p> <p>Resistance possible for nonconformities that simply generate costs.</p> <p>Innovations proposed at the organisational level:</p> <ul style="list-style-type: none"> • Random but regular control of containers. • Systematization of constructive feedback with the managerial staff and assessment of it. <p>Improvement proposed at the dyadic level: STBCF</p> <p>Result: none of these actions (innovations and improvements) were implemented due to a lack of human resources.</p>	<p>Abnormal rate of non-compliant coding.</p> <p>Improvement introduced at the dyadic level: STBCF of the MID regarding abnormal error frequencies</p> <p>Result: variable according to the CMIO depending on the level of resistance shown by the departments.</p> <p>Innovation proposed at the individual level: taken into account in the personal assessment.</p> <p>Result: The action was not implemented due to its supposed lack of effectiveness.</p> <p>Improvement introduced at the organisational level: increased controls on problematic coders</p> <p>Result: positive, but short-lived according to the CMIO.</p>	

Table 6. Follow-up to the suggestions made and results of the actions implemented (continued)

DEFENCE	Subject Monitoring of peripheral venous catheters (PVC)	Sorting of healthcare waste	Coding of diagnoses and interventions
RECOVERY	<p>Possible by the nurse or nursing auxiliary. Innovation introduced at the dyadic level: managerial staff encouraged nurses to fully carry out their error recovery role. Implemented: primarily for the SRNs, and will only be subsequently introduced for the nursing auxiliaries. Result: The observations of the inside member make it possible to conclude that there was an improvement.</p>	<p>No proposal. NB: If recovery is not instantaneous, it is hard to imagine.</p>	<p>No proposal. NB: it is one of the roles of the MID to recover coding errors.</p>
MITIGATION	<p>Once it reaches a criticality level corresponding to grade 3 on the Maddox scale, the attending physician must be informed. Innovation introduced at the dyadic level: • Managerial staff encourage employees to reveal the situation quickly and systematically. Result: no phlebitis during the period. • Sanctions for late disclosure and attempts to deal with the problem in secret. Result: the measure was not specifically implemented, but sanctions were imposed for the first time in a long time for serious breaches of the rules of professional conduct.</p>	<p>No proposal. NB: In the event of a health hazard due to ICW being put with CW, the mitigation measures cannot generally be taken by the person who infringed the rule.</p>	<p>No proposal. NB: if it is not corrected, a coding error exposes the hospital to sanctions by the supervisory authorities.</p>

* Due to the risks inherent in phlebitis, the French High Council for Public Health (HCSP - 2010) recommends monitoring the state of the patient and the site of the catheter at least once a day. The association of monitoring of the site with the control of vital signs (pulse, blood pressure etc.) made it possible to avoid most of these omissions.
 ** Non-problematical situations are shown in grey.
 *** In general, maintenance of the results would require continuous effort, which is undermined by the pressure of competing priorities on the human resources available.
 **** This revision can be carried out in the form of short training sessions. It is recommended that the training should be provided in the field (ANAP, 2010). It is suggested that it should be based on tools such as the fun one provided by the ANAP for the sorting of waste (Déche'rn).

Three levels of granularity

Safety issues in an organisational context are discussed in the literature at three levels of granularity: the individual, the man-machine interface, and finally the organisation (Reason, 1997: 224).

The approach favouring the individual level leads errors to be attributed to psychological inadequacies: lack of attention, experience, care, motivation or caution. The policy for remedying errors has a disciplinary nature. It appears necessary to us to set the studies carried out at this level of granularity within a wider framework: that of the local managers, including the line manager, as well as the experts with whom the operator is in regular contact. This broadening of the framework makes it possible to enhance approaches that focus solely on the balance between contributions and rewards, by including the support activities that the local managers can provide for operators, and by taking into account the reciprocal obligations that the operators may feel in return. Consequently, in the remainder of this article, as a unit of analysis for this level of granularity we will use either the individual himself, or a dyad comprising the individual and the local actor concerned, i.e. the manager or expert.

The second approach encountered in the literature can be described as an engineering approach (Reason, 1997: 225). It favours the man machine interface as unit of analysis and in particular its informational properties. Error is no longer due to individuals; it is the result of the incorrect matching of man and machines or design faults in the machines.

The third approach favours the organisational level (Perrow, 1984; Reason, 1997; Turner, 1976; Turner & Pidgeon 1978) and sees human error more as a consequence than a cause. Errors reveal latent conditions that result from decisions taken by high-ranking officials, within or outside the organisation (Reason, 1997).

Although these three approaches are not incompatible (Reason, 1997: 224), the literature tends to disparage the individual approach and favour the analyses carried out at the organisational level. In accordance with the recommendation of Reason (1997: 228), we have decided to use all three approaches. Table 6 shows the granularity level for each action: organisational, man-machine interface or individual in the broad sense. Although all of the actions presented cover all three types, the distribution of the actions within each type varies very noticeably depending on the case studied. For example, costing of hospital stays is the only activity where the engineering aspect is applied, through actions concerning the man-machine interface.

PRESENTATION OF THE FOLLOW-UP TO THE SUGGESTIONS MADE AND RESULTS OF THE ACTIONS IMPLEMENTED

After indicating the suggestions made by our team, each cell in Table 6 shows the follow-up to the proposals and the results of the actions implemented. Regarding follow-up, three possibilities may be identified. Firstly the suggestion may not be implemented, or it may have been implemented initially and then been modified more or less substantially, as was the case for monitoring of PVCs and the sorting of waste. For these two tasks it was suggested that constructive feedback should be systematically provided by the department managers (systematization of task-based constructive feedback - STBCF). The difficulty of implementing this suggestion led to a more elaborate system being developed that included the managers, but gave responsibility for feedback to the local experts, i.e. the referent nurses. For suggestions that were implemented, four types of results were identified. Firstly the suggestion may not have had a significant observable impact. The equipping of the surgical unit with IT resources provides an example of this. This was intended to avoid additional interventions to the principal surgical operation being omitted from coding due to the

unavailability of computers in the ward located near the unit. To be effective, it was necessary to modify the computer program which required the surgical operation to be coded first. Since this modification could not be made, there was no significant change in the level of omissions.

The action may have had a positive impact, but this was short-lived. This was the case in situations where maintenance of the results would have required continuous effort, which was undermined by the pressure of competing priorities on the human resources available. The third type of result involves a significant improvement, which means that it is necessary to pay attention to the conditions for maintaining the improvement. This is the case for task-based constructive feedback (TBCF), formally identified as part of the remit of referent nurses. Their role helps to maintain the improvement recorded. In view of the high level of mobility of the paramedical staff, it is important however that the referent nurses are not distracted by other priorities in their work. The final type of result corresponds to significant improvements that we consider to be lasting. The only example of this is the association of catheter monitoring with the control of vital signs. Like TBCF, this association has the benefit of being formally included in the functioning of the hospital, but it is not threatened by a change in priorities likely to affect the workload of employees.

ANALYSIS OF THE ACTIONS PROPOSED AND THEIR RESULTS

IMPACT OF THE SITUATION ON THE FUTURE OF THE PROPOSALS

The proposals made by our team are linked to situations that differ in three aspects: the actors concerned, the importance of the task within the hospital's mission, and level of priority it is given by the management. The first aspect distinguishes the medical and paramedical spheres. The paramedical sphere is characterised by adherence to the notion of hierarchy, and considerable decompartmentalization of activities within the four main sectors that the hospital comprises. Conversely, the medical sphere is split into about twenty departments with undeniable autonomy. As a result the proposed actions concerning nursing staff were less costly to negotiate than those concerning the practitioners. The different structure of the two spheres can be seen both in the implementation of the proposals and in the results: that of the nursing sphere, mainly concerned by monitoring PVCs and the sorting of waste, contrasts with the heterogeneity of the medical sphere, which alone is concerned by coding.

The second aspect involves the distance of the task from the central mission of a hospital. Of the three tasks studied, monitoring PVCs is the one that is the most closely linked to the notion of healthcare, and is also the one for which the issue of the availability of resources did not arise. Conversely, coding was the task that was the furthest removed from the notion of healthcare. In this field, the only significant progress was due to the improvement of the recovery function carried out by the Medical Information Department. As regards the hospital's mission, the sorting of healthcare waste has an intermediate position compared with the two other tasks: it involves economic concerns like the costing of hospital stays, but management of the health hazard linked to ICW means that it also involves health concerns. It should be noted that it was also in the aspect of the task that involved a health hazard, putting ICW with CW, that the most significant progress was achieved. In short, it appears that the mobilisation of the actors decreases the further the task is removed from the core mission of the hospital.

The third aspect that had an impact on the future of our proposals was the priority of the task concerned for the management. A manager's agenda is

continually changing, as he decides between various priorities. Throughout the research, the safety of patients and the value of the activity based on the costing of hospital stays retained their position as a top priority for the director. Unlike these two issues, waste management did not remain a priority. Bringing the sorting equipment and zones into compliance with the regulations reduced the seriousness of the problem in the eyes of the management, and this relegation in the list of priorities had a greater impact when the employees responsible for this task left their positions in the course of their normal career advancement. Their successors were appointed with other objectives and devoted most of their time to other duties.

IMPACT OF THE CHARACTERISTICS OF THE ACTIONS ON THE RESULTS

The actions proposed by our team can be distinguished by two characteristics. The first involves the extent of the change that they introduce compared with the hospital's practices, distinguishing innovations from improvements. An innovation generally requires the development of new skills and greater effort than a simple improvement of the existing system. Consequently, we expected improvements to be more easily accepted than innovations, and their results to be more easily achieved. This is not confirmed by the data in our possession. The second characteristic shows that there were two complementary and antagonistic types of action: enabling and disciplinary. We will firstly present the aims of each type and the balance between enabling and disciplinary actions for each of the three tasks studied, before showing the dialogical nature of this balance.

ENABLING AND DISCIPLINARY: TWO SEPARATE BUT INTERDEPENDENT TYPES

Even though enabling and disciplinary actions support each other, it is possible to present successively the aims of each type of action.

Promote learning to develop skills and improve attitudes

The main aim of this approach was to achieve learning, but we did not rule out the idea that the norm of reciprocity (Gouldner, 1960; Cialdini, 1984) would in return cause the beneficiaries of this support to increase their contribution to the organisation.

Systematization of task-based constructive feedback. The high level of occupational mobility led us to conclude that the errors committed were mainly due to the inexperience of the employees: rules that are comprehensive, as defined by Leplat and Hoc (1983), for experienced employees, are not necessarily comprehensive for novices. In order to improve operators' skills, we recommended using the expertise available both within (managerial staff in the case of PVCs and waste) and outside the department (MID for coding). As stated by Leplat (2006:19), regarding the importance of making use of feedback with regard to training, "we do not learn from practice, we learn from practice the results of which are known". Actions of this type had already been introduced before the research. One of the contributions of our research was to suggest that the interventions by managerial staff or experts a) should be systematic and not just occasional¹⁰, b) should be based on objective and regular measurement of the breaches observed¹¹ and c) should apply the recommendations of the literature regarding interventions by the managerial staff. It was therefore necessary to promote the "systematization of task-based constructive feedback" (STBCF) by the various actors likely to do this for the operators.

Since there are reasons to believe that interventions are more effective if they are backed up by theory (Cane, et al., 2012), we relied on the research

10. In the past, a reversion to previous practice was often observed at the CoRe hospital following programmes of actions carried out for the purpose of certification. Our proposals were therefore guided by the recommendation of the ANAP (2010) not to relax efforts after obtaining results and to carry out periodic controls.

11. A similar recommendation is made by the ANAP (2010) regarding sorting, and by the Meah (2008a) regarding coding of interventions.

carried out in this field (Alder, 2007; Anseel, et al., 2009; Kluger & DeNisi, 1996, 1998) to recommend to the managerial staff and the experts in the MID, to a) position their intervention as close as possible to the task, b) make sure that it is constructive c) ensure that it has a systematic nature.

Indirect benefits of constructive feedback. The form of action that has just been presented also provided indirect benefits. Building on the concept of social exchange (Blau, 1964) and the norm of reciprocity (Gouldner, 1960), the literature suggests that constructive and beneficial actions by the representatives of the organisation for the employees, help to establish high quality exchange relationships (Konovsky & Pugh, 1994). They also impose on the employees an obligation to reciprocate in a way that is also constructive and beneficial (Rhoades & Eisenberger, 2002). In an organisation such as the CoRe hospital where the ability to reward is limited, the indirect benefits of constructive support provided to employees or colleagues could not be neglected.

Punish in order to improve reliability and combat anomie

We observed that the power to punish was rarely used at the hospital, and only with great restraint. Based on a survey of all employees (cf. Appendix B, table B1) we consider that the management's reluctance to use sanctions was related to the strong feeling of impunity present among the staff. We recommended restoring the importance of sanctions. This recommendation was intended to overcome the harmful effects of breaches on the organisation, in addition to the aim of reducing the frequency of deliberate infringements of rules.

Sanctions have been defined (Kazdin, 1975: 33-34) as a means of associating something unpleasant with (or dissociating something pleasant from) a behaviour, in order to reduce its frequency. Until the beginning of the 1980s the literature tended to advise managers not to punish their subordinates because the negative side effects were greater than the benefits (Luthans & Kreitner, 1985). However this traditional approach to sanctions lacked references to organisational situations, and since it was not possible to produce scientific quality results, it tended to put forward moral considerations (Arvey & Ivancevich, 1980). From the 1980s, researchers recognise that the use of sanctions can have a positive impact on the attitudes and perceptions of employees (Arvey, et al., 1984; O'Reilly & Puffer, 1989; Podsakoff & Todor, 1985), particularly when the sanctions are based on the employee's performance (Podsakoff, et al., 2006). Among the neglected benefits of sanctions, they also mention the fact that they a) maintain social standards within a group, b) inform the other members of unacceptable behaviour and c) contribute to the perception that authority is fairly exercised (Trevino, 1992). The interviews carried out at the CoRe hospital confirm this analysis. On several occasions, the people we interviewed said that they were shocked by certain types of behaviour, particularly those that endangered personal safety. They regretted that they were not punished, since it appeared to them that it was detrimental to the smooth functioning of the organisation.

Moreover, the nature of the activities studied at the CoRe hospital led us to relativize the standard argument that sanctions that show the behaviour to be avoided without saying anything about the required behaviour are likely to be disconcerting. In fact, for these activities the required behaviour is clearly established and there is therefore no reason for the sanction to leave the employee at a loss regarding the way to behave.

Based on these analyses, for each of the tasks our team defined breaches of rules for which it was urgent to reduce the frequency and specified the conditions for imposing sanctions. The simplest situation was that of the costing of hospital stays. Those responsible for coding errors can be identified without difficulty, and error rates can be easily compared. It was therefore suggested that the error rates should be included in staff assessments, after appropriate

feedback concerning the errors committed. Regarding the sorting of waste, controls do not make it possible to identify the person responsible, but to compare different departments. It was therefore proposed to make the department managers responsible for nonconformities, and take them into account in their assessments. In the case of monitoring PVCs where the risk of omission is under control, the problem that remains is incorrect assessment of the situation by employees, and particularly novices. It was suggested that concealing errors, rather than the errors themselves, should be punished, since concealing them is likely to delay the measures needed to reduce their harmful effects.

It is important to emphasise that the idea of sanctions is included in the notion of discipline, but is only one aspect of it. For example, associating monitoring of catheters with the control of vital signs had a disciplinary effect, but does not necessarily constitute a sanction. As will be seen below, disciplinary actions that do not constitute sanctions represent highly effective levers for progress.

BALANCE BETWEEN ENABLING AND DISCIPLINARY ACTION WITHIN EACH ACTIVITY

PVC: revised proposal, balance between the enabling and disciplinary aspects, and a marked improvement in practices

Following a serious adverse event in summer 2011, monitoring of PVCs became a priority for healthcare management. The initial proposal made by our team involved requiring department managers to provide training and support for the nursing staff for fitting and monitoring PVCs. Once this had been introduced, it was decided to carry out a flash audit to assess the change in risks. This was carried out in February 2013 and produced worrying results: although no adverse events were recorded, the rules regarding the monitoring of PVCs were not mastered by most of the nursing staff. An informal inquiry carried out among nursing staff by the senior executive who was an inside member of the research team showed that the interventions by local managers did not have the enabling nature that was intended, and were seen as disciplinary by employees. The interviews carried out with managers by the inside senior executive showed the reason for this negative result. Since the managers were occupied with time-consuming tasks such as managing staff schedules or beds and unprepared or inadequately trained to carry out their managerial role, they devoted little time to training and daily support for their colleagues. This assessment agrees partly with that of Detchessahar (2011: 99) based on about fifteen inquiries carried out in organisations belonging to various sectors: "far from suffering from over interference or the omnipresence of the management, the employees of the organisations studied suffered from the absence... of a manager who is detained, caught up by other requirements than those of work and leadership".

The action initially proposed had two objectives. The first declared aim was to improve operators' skills. The second was to re-engage all local managers in the work of their team. Contrary to the suggestion of Detchessahar (2011), we considered that the obstacles faced by some managers were due more to their understanding of their role rather than to any organisational constraints, considering the freedom that the assessment system gives to managers in the interpretation of their role, and in view of what other managers are able to do. The lack of progress on our second objective led us to give priority to the first one, and to revise the approach, which was all the better received by the local managers since the relinquishment it introduced preserved their authority and came after the failure of a solution that gave them the leading role.

The new system was based on mobilising expert peers, i.e. the referent nurse and the public health nurse, acting on the authority of the local manager.

The role of trainer-mentor is mainly carried out by the referent nurses. In addition to the methodological and educational support that they provide to the nursing staff, referent nurses act as an interface with the medical team, in particular during handover. They also manage risks and adverse events. It is in this aspect that the public health nurse intervenes occasionally to support the referent nurse. Although they have a lesser role, the local managers are still involved in the approach, which they favour by granting time and resources to the referent nurses. The observations made by the senior executive, an inside member of the team, make it possible to conclude that there was an improvement in the monitoring of PVCs. Discussions with the staff suggest that the effectiveness of the reorganised system is due to two factors: The first is the enabling character of the organisation put in place. The referent nurses available to support the nurses have solid experience in the field and are recognised as such by the staff. Moreover, they are seen as peers by the nurses, in spite of the hierarchical power delegated to them. As a result, exchanges are more open and trusting than with the managers. The second factor is related to the disciplinary nature of the system due to the combination of four measures: association of monitoring of catheters with control of vital signs, IT traceability of monitoring of PVCs, maintenance of the system within a hierarchical framework, and application for the first time for a long time of sanctions for serious breaches of the rules of professional conduct. Following the actions implemented, monitoring of PVCs was given greater prominence and seen as a treatment in its own right, that should be provided in strict compliance with professional practices.

sorting of healthcare waste: change of priorities, lack of disciplinary measures and mixed results

After a garbage inquiry, which had shown the extent of the breaches of the rules for sorting healthcare waste, in 2011 the management of the hospital asserted its intention to regularly carry out random controls in the departments, in the presence of the staff and if possible of the department manager. It considered that the managers concerned would feel that their reputation was at stake due to the public nature of these actions, which would have a disciplinary effect. These controls required too many employees and were quickly abandoned. Shortly before our team examined the issue of sorting, the hospital management had fitted out suitable storage areas and made available to the employees the equipment (suitable stands and containers) needed to carry out compliant sorting.

The awareness campaigns and training, which existed previously and were mainly intended for new staff, were maintained during the period. As in the case of monitoring of PVCs, the system was initially based on the local managers before being reoriented towards intervention by peer-experts, i.e. the referent nurses and public health nurses. The public health nurses had numerous opportunities to pass on messages, but because they were generally provided outside the working context, the messages were not seen as very enabling by the recipients. It was therefore the referent nurses who were finally entrusted with the task of supporting the employees in their work. The audit carried out in June 2013 of all of the surgical departments and some of the medical departments showed mixed results. Except in one department ICW was no longer found in CW containers, but there was no improvement in the use of ICW containers which are still often either too full or inappropriately filled (e.g. plastic bags used for sharp ICW). Similarly, too much CW is still put into ICW containers. All in all, although it was reduced, the health risk still remains, whereas putting CW with ICW continues to put a strain on the hospital's budget. Two factors can be put forward to explain the poor results compared with those obtained for monitoring PVCs: over time, the issue of sorting healthcare waste was no longer seen as a priority, and no disciplinary measures were taken to ensure compliance with the rules.

Costing of hospital stays: enabling measures hardly have any effect without any disciplinary measures, and an effective but second-rate policy is implemented

Since the introduction of activity-based pricing, the costing of hospital stays has become a key issue for hospitals. The hospital management is therefore concerned to raise the awareness of practitioners of the importance of rigorous coding. When our team started to study the question, according to the CMIO communication on this topic had had a very different impact depending on the age of the practitioner. Young doctors and surgeons had been made aware of coding during their training, and were more receptive than older ones to the messages they were given, and the CMIO observed significant learning effects among practitioners who had arrived recently. On the other hand, there was no lasting sign of improvement in the quality of the coding carried out by practitioners with a greater length of service. As was the case for the other tasks, the proposals made by our team included both enabling and disciplinary measures. A large proportion of the enabling measures were based on the systematization of task-based constructive feedback provided by the MID. The impact on the target population was seen as disappointing. Some actions, such as intervention by the CMIO during unit committee meetings, had a positive but short-lived impact, according to the CMIO; others, such as sending the practitioners the corrected coding file, could not be seen as having even a small or temporary positive result, according to the CMIO. Repetition of the same errors, and the content of interactions between the MID and practitioners¹² led the CMIO to conclude that no significant learning had taken place.

The limited effectiveness of the measures recommended on the population that showed resistance to coding, the energy they required for the MID and the temporary nature of their effects, together with the lack of a decision regarding taking the quality of coding into account in the assessment of practitioners led the MID to develop an alternative policy based on improving error recovery. This policy was adopted in the absence of anything better, at least on a temporary basis, and made it possible to increase the reliability of coding, although it involved investments in software and an increase in the department's workload. Errors are not always recovered, but the results of random in-depth inquiries carried out suggest that there was a marked improvement in risk control. This alternative system was not in itself either enabling or restrictive.

THE DIALOGICAL NATURE OF ENABLING AND DISCIPLINARY MEASURES

In conclusion, it appears that measures that are purely enabling (sorting of waste and coding of diagnoses and interventions), or purely disciplinary (initial system for monitoring PVCs) did not produce satisfactory results, unlike what is observed when both types of measures are used in a balanced manner (monitoring of PVCs after modifying the system). The notion of balance is interesting from a descriptive point of view, but it does not account for the dynamic relationship between both types in the case of basic rules. The comprehensive nature of such rules makes it possible to require experienced operators to comply strictly with them, under nominal conditions. Before the same demands can be made of a novice operator, enabling actions must have made it possible for the operator to carry out the task without acquiring other skills.

This apparently unoriginal observation gains new significance if we consider that the mobility of paramedical staff at the CoRe hospital is about 30% depending on the department and the year. This means that the mechanism of reversion to previous practice probably does not have the importance it is given by the members of the hospital, including the management, for the monitoring of PVCs and sorting of waste. According to this mechanism, the mobilisation caused by the closeness of a certification visit only produces a very short-term improvement in behaviour.

12. Doctors continue to call the MID to find out why their coding has been altered.

This is confirmed by the observations and accounts collected by one of the inside members of our team: some operators do indeed change their behaviour according to the pressure on them to comply with certain prescriptions. In view of the high level of staff mobility, this explanation must however be completed. The effects of the efforts made at a given time, for the purposes of certification or for other reasons, necessarily decline as the members of the workforce are replaced. It is essential to take this second mechanism into consideration from a managerial point of view. The explanation based on reversion to previous practice suggests that failure to comply with rules is due to actors who are capable of complying with them, but are negligent, and that it is therefore legitimate to punish them; the explanation based on mobility on the contrary encourages the development of enabling actions.

Where enabling actions are made necessary due to the lack of skill of operators, they are a prerequisite for the introduction of measures that have the nature of sanctions. Failure to respect this condition would lead not only to practical problems, but would raise the questions of the legitimacy of the sanctions. If we acknowledge that there will inevitably be novice operators, disciplinary measures require enabling ones in order to be legitimate.

However, the dialogics that unite these two notions go beyond this logical sequence, insofar as they have a mutually inclusive relationship: enabling measures are disciplinary to a great extent, and disciplinary measures are enabling. For example, the obligation for inexperienced nurses to apply the Maddox scale guarantees patient safety. It unquestionably has an enabling nature. But the training courses in the use of the scale mean that, at least temporarily, the behaviour of the nurses falls within an “if... then” type of rule system, characteristic of an intermediate level of cognitive control which an individual can have over performance of the tasks within his remit. In other words, although this system is enabling, it does not allow the nurses to achieve the level of expert (Dreyfus, 2015).

Finally, it is interesting to note that enabling systems can give rise to the development of interpersonal relations that include a disciplinary aspect. The inquiry carried out among hospital staff in connection with the project to transform the organisation of the hospital (cf. Appendix B, Table B1) shows that employees feel indebted to colleagues who helped them to cope with the demands of their work. This led us to believe that an enabling system, such as that put in place for the monitoring of PVCs, produces a feeling of indebtedness due to the norm of reciprocity (Gouldner, 1960; Cialdini, 1984). It would therefore be natural to settle this debt by implementing the knowledge transmitted, in this instance by the peer-experts. No systematic inquiry has been conducted of this aspect, but the observations made by an inside member of the team confirm this assumption.

DISCUSSION

The notion of basic rules leads us to revise or complete the analyses of the critical tradition regarding rules and the HRO approach. It also leads us to no longer consider enabling and disciplinary measures as thematically opposed, but as having a dialogical relation.

BASIC RULES: THE BLIND SPOT OF THE CRITICAL TRADITION

Our analysis of the literature shows the relevance of the critical tradition regarding rules, but emphasises its limits. Because it posits that rules are necessarily incomplete, the critical tradition in sociology and psychosociology

turns infringements of rules into a daily necessity, essential for innovation. Based on the work of ergonomists (Leplat & Hoc, 1983), we suggest that two types of rules should be distinguished. The first, which we describe as complex rules, are those discussed in the critical tradition: rules are a social construct resulting from the interplay of interests and powers. They are part of a bigger system that gives them their meaning; their maintenance is more a question of legitimacy than effectiveness, and their implementation cannot be reduced to performance alone. Those whose behaviour the rules are supposed to determine must adapt to conditions and developments that were not envisaged by those who designed them. The second type are rules that we describe as basic. These differ from complex rules in four ways: they are consensual in the sense that no alternative rule is put forward by the actors; they are assessed on the basis of their effectiveness; due to their comprehensiveness they can be applied by an experienced operator without acquiring additional skills; and finally, they can be managed autonomously due to their loose attachment to the rest of the system they belong to. The empirical section of the present research made it possible to reveal the existence of such rules in an organisational context.

The main contribution of this research consists therefore in the criticism of the argument that real work necessarily differs from the prescribed work, in the same way that the actual rule differs from the declared rule (Babeau & Chanlat, 2008; Clot, 1995: 102; Dejours, 2003: 14; Friedberg, 1992; Girin & Grosjean, 1996: 5; Linhart, 1994: 78; Reynaud, 1993: 35). We consider that this argument, because it claims to be universal, ignores basic rules, which are a specific case but are important in practice.

Secondly, we propose that, in the case of basic rules, the notion of human error retains all its significance whereas "it has become almost mundane to claim that reliability and failure are produced by the organisation" (Bourrier, 2001: 9) and "human error" has been criticised as a meaningless concept corresponding to an oversimplified representation of reality (Hollnagel, 2005). We also show that the demonstrations of human error can be usefully analysed using the conceptual frameworks proposed by Rasmussen (1983, 2000) and Reason (1993). This led us to give greater importance to the individual level, in terms of errors and responsibility, as well as to the disciplinary aspect of management. Our intention however is not to limit the managerial approach to this level and this aspect. Regarding the level, we followed the suggestion of Reason (1997) which involves exploiting the potential of multi-level approaches, in order to give managerial interventions the variety required by the situations that we studied. Failure to comply with rules may be due to organisational conditions. For example, the unavailability of the equipment required may result in the infringement of a rule, whereas interruptions due to the need to meet more important priorities can cause omissions. In order to carry out a basic rule, the nominal conditions for its performance must be present; only once this requirement is met is it possible to require strict compliance with the rule by all experienced operators. For these reasons, the situations were analysed and proposals were made at three levels: that of the individual, which is often broadened to include interactions with the managerial staff, that of the man-machine interface, and finally that of the organisation.

Thirdly, whereas the literature tended to stress the potentially creative nature of errors and infringements (Alter, 2002; Tsoukas & Chia, 2002) and the benefits in terms of learning (Hollnagel, 2005), our research suggests that it is highly unlikely that failure to respect basic rules can have a beneficial effect. The activities studied involved applying, in relatively simple situations, a set of unambiguous instructions that left no room for personal judgement or emergent innovation. Admittedly, in each of the activities the operator can use his own judgement to categorise the situation, but this will always be due to a lack of knowledge of the applicable rules. Regarding the possibility of an emergent

innovation, it should be stated that the categorical frameworks that control the practices studied are regularly updated. However, if the rules change, this is carried out deliberately and not emergently, intermittently and not continually. Changes result from decisions made at the national level, and between two revisions, the rules are clear, stable and essential for the actors. It therefore appears highly unlikely that the infringement of categorical frameworks that have been extensively tested for a long time could result in innovations offering benefits at the collective level. It follows that, in answer to the argument that “working well always involves breaches” (Dejours, 2003: 15), we argue that when basic rules must be enacted, it is necessary to require rigorous compliance. We are not of course so naive as to suggest that these rules can suffice to ensure the reliability of the operations of even a relatively simple organisation - no method could achieve such an ambition - we merely suggest that strict compliance with them is likely to reduce the risks incurred.

THE CONTRIBUTION OF BASIC RULES TO ORGANISATIONAL RELIABILITY

Research into organisational reliability has studied the errors and infringements affecting complex and/or large socio-technical systems (Bigley & Roberts, 2001; Perrow, 1984; Turner & Pidgeon, 1978; Vaughan, 1996; Weick, 1988, 1990). An initial explanation of this tendency is based on the challenge that the behaviour of complex systems represents for human understanding; a second explanation is based on the link that often exists between the size of the system in question and the extent of the effects that a breach of the rules can have. The lack of attention given to failure to comply with basic rules in smaller and less complex systems is due to the fact that they are seen as less relevant from a practical point of view and less stimulating at the intellectual level. This understanding must be corrected in two ways. Firstly, it is true that none of the malfunctions studied in this article can alone have the disastrous consequences of an error in the management of a large system, such as an aeroplane or a nuclear power station. However, insufficient monitoring of catheters or incorrect packaging of ICW can cause mini-disasters which, repeated at the societal level could have greater effects than those of more striking disasters (Van Cott, 1994). Secondly, although the situations studied do not represent a challenge for the operators' understanding, they require a more sophisticated method of management than is suggested by the literature, and therefore represent a sufficiently stimulating challenge to merit interest.

Moreover, the principles governing basic tasks have led us to consider an alternative model to that developed by the HRO movement: that of “ultra-safety” developed by Amalberti *et al.* (2005). This is due to the fact that the tasks concerned by basic rules involve nothing unexpected, and to carry them out an experienced member does not need to interact with other members to make sense of the situation. Conversely, the ability to manage the unexpected which is central to the interactionist approach to high reliability, is based on the quality of the reciprocal listening and exchanges between the members. This does not mean that basic rules are limited solely to tasks carried out by an individual on his own; they can also concern tasks the performance of which depends on the behaviour of third persons affected by application of the rule. This is shown in the case of serious adverse events (SAE) linked to medicines, also discussed by the HRO movement (Roberts & Bea, 2001; Roberts, *et al.*, 1999; Weick & Sutcliffe, 2001: 76; Weick, *et al.*, 2005).

After invasive procedures and infections linked to treatment, medicines represent the third biggest cause of SAEs in healthcare institutions in France (Michel, *et al.*, 2010). In addition it has been observed that a large proportion of errors relating to dispensing medicines by pharmacists and distribution of them by nurses was due to the provision of handwritten or verbal prescriptions, and to the

misunderstandings that these methods of communication cause (Roberts & Bea, 2001). In this type of situation, reliability is compromised in particular by the difference in status between doctors and the other professionals (Roberts & Bea, 2001). The fact that doctors alone are considered as being responsible for the patients' treatment results in the other professionals merely being expected to follow orders and not exercise vigilance. Due to a lack of incentive, problems are not identified and deaths occur that could have been avoided (Roberts & Bea, 2001). In this connection Edmonson (2003, 2004) notes that the atmosphere within the team and the level of psychological safety felt by the members are decisive factors for the quality of the interactions. The possibility of individual and collective learning is also dependent on them, as is ultimately the organisational reliability.

It is not our intention to criticise proposals to improve collective vigilance by improving the quality of listening between members and respect for their respective skills (Weick, 1993). Nevertheless, establishing basic rules still appears to us to be important in situations where, as in the case of managing medicine-related risks, improving patient safety involves interactions between members of the organisation. This is illustrated by an observation in another hospital. In the hospital in question, a rule was introduced that required pharmacists and nurses to refuse any handwritten prescriptions, and especially verbal prescriptions. By reducing the risk of SAEs, compliance with this rule also made it possible to reduce risk of nursing staff being held criminally liable. In addition to the communications and awareness campaigns to be carried out among the different types of employees, the effectiveness of such a rule depends on a clear and firm commitment by the management to support the nurses and dispensary staff, especially during the period when the rule is introduced. A rule of this kind does not solve all medicine-related problems in hospitals. In particular it does not deal with the issue of inadequate prescriptions and the possibility of recovery of this type of error by the nursing staff. Even if the basic rules that we propose have more limited objectives than those specified by Edmonson (2003, 2004) and the HRO movement, they are effective and comply with the main principle of professional risk prevention, which is to avoid risks by eliminating their cause.

ENABLING AND DISCIPLINARY: FROM THEMATIC OPPOSITION TO A DIALOGICAL APPROACH

The distinction between enabling and disciplinary approaches is not wholly new in management literature. It symbolises the debate between those who have a negative view of bureaucracy, who maintain that formalisation stifles creativity, causes dissatisfaction and discourages employees, and those who have a positive view, valuing what formalisation can offer in terms of clarifying roles and supporting action (Adler & Borys, 1996). In other words, the thematic opposition identified between these two aspects of organisational functioning (Holton, 1982) has provided the basis for academic debate. Starting with the standard typology of Burns and Stalker (1961), Adler and Borys (1996) propose a typology that is able to encompass all of the works regarding this thematic opposition. Whereas organisations were usually distinguished according to their level of formalisation, either high (mechanic) or low (organic) Adler and Borys (1996) suggest that they can also be distinguished according to the enabling or restrictive nature of the formalisation. The addition of this second aspect enables authors to create a typology that includes autocratic organisations and enabling bureaucracy with the types already mentioned. In spite of its relevance, the contribution of Adler and Borys (1996) remains dependent on the thematic opposition between disciplinary and enabling measures. This article suggests that this opposition can be

overcome and proposes a management model for dealing with compliance with basic rules that includes both themes as well as their interrelations.

Firstly, if we look at the disciplinary aspect of management, we are convinced that the criticism it has received is justified, but we also consider that it is excessive. Discipline does not only involve sanctions, as is shown by the effectiveness of the measure that associates monitoring of catheters with control of vital signs, and in the case of basic rules sanctions do not have the defects that are attributed to them. Consequently, although the traditional approach that involves looking for someone to blame and punishing him is often counter-productive, this is not the case in the situations studied for two reasons. Firstly, the risk that the punished person does not know what to do does not arise here, because what needs to be done is clearly established for all experienced operators. Secondly, employees who see these basic rules as legitimate and endeavour to respect them often stated during the research that they expected breaches of these rules to be punished. Ignoring this expectation can only help to produce a feeling of anomie. Consequently, the discipline exercised at the individual level has an enabling effect at the collective level.

The enabling aspect of management is essential in the situations studied. Compliance with basic rules can only be demanded of experienced employees. However, due to the occupational mobility of the employees, the workforce of an entity may include a high percentage of people new to their career or job. Support for them by the managerial staff has the direct effect of enhancing their skills. In addition, if it is carried out well, enabling intervention by managerial staff shows the support provided to employees in carrying out their duties and may give them an obligation of reciprocity. Conversely, a lack of support would have the effect of undermining the legitimacy of any sanctions; which means that enabling action is a necessary condition in this instance for disciplinary action.

In short, recognition of the distinctive features of basic rules leads to a dialogical understanding of management where disciplinary and enabling aspects are not simply complementary, but have a mutually supportive dialogical relation.

LIMITS OF THE RESEARCH AND APPLICATION TO OTHER SITUATIONS

One of the limits of this research is the small number of sample situations studied in a single hospital. Widening it to include other cases in different types of organisations would probably have made it possible to identify other phenomena, enhance our explanations and test a larger number of proposals. The decision to work on three cases within the same hospital is not the result of the usual choice between variety and depth, it is due more directly to the collaborative nature of the research. The exceptional nature of this type of system can clearly not be duplicated *ad libitum*, and the question of starting a second project in another establishment was therefore not envisaged. Increasing the number of tasks to be studied did not pose the same problem and the possibility was discussed, but for the reasons already mentioned we decided to limit ourselves to the cases identified by the hospital management. Under these conditions, what can be said about the internal and external validity of our analyses and results?

According to King *et al.* (1994: 120), detailed research concerning a small sample can only have very limited ambitions from the point of view of its internal validity. However, as has been shown by Campbell (1975), the internal validity of research depends less on the number of cases studied than on their quality. A single case may be sufficient, if it is possible to extract data that make it possible to test the implications of the explanations proposed. In the present case, the knowledge of the establishment and the hospital environment of the inside members of the team, their ability to find relevant information and their competence regarding the issues dealt with provide reasonable assurance of the quality of the data collected and the reliability of the explanations given.

External validity can be seen on three levels: do the proposals made in this article apply to other hospitals, other tasks and other areas of activity? Regarding their application to other healthcare institutions, it should be noted that the issues studied in this article are being studied at the national level, and even at the international level as regards monitoring of PVCs and sorting of healthcare waste. Moreover, knowledge of other healthcare institutions where they are applied offers reasonable assurance of the viability of policies based on strict compliance with basic rules. Regarding the application of our proposals to other tasks, the case of medicines discussed above provides an initial example of possible generalization; another example is the use of checklists which is becoming widespread, particularly in the surgical sector. Beyond the health sector, without entering the field of complex technological systems, the authors' knowledge of other sectors such as food processing, regarding food safety, and activities such as professional driving, lead them to conclude that it is possible to apply our proposals to contexts other than hospitals.

CONCLUSION

Although they are central to organisational functioning that is seen as complex, rules are generally assessed unequivocally, and the literature is divided between those who defend their merits and those who criticise their defects. To reconcile these two traditions of thought, we suggest that there are two types of rules: complex rules that cannot be followed to the letter, and basic rules that must be strictly respected.

In the course of collaborative management research carried out in a hospital in Île-de-France, we studied three activities and made proposals for managing breaches of the basic rules linked to these activities. As recommended by Reason (1997), these proposals were made on three levels: the organisational, engineering and individual levels. Whereas interventions carried out at the individual level have been widely discredited by studies of complex technological systems, our research shows their value when the relative simplicity of the situation makes it possible to formulate basic rules. In this case it also suggests that it is necessary to reconsider the idea frequently put forward that since the unwanted side effects are greater than the benefits, it is necessary to avoid systematically punishing the operators.

Based on the observations made before and after implementing our proposed actions, we suggest adopting a managerial approach that we describe as dialogical because it combines enabling and disciplinary aspects, recognising them as both complementary and antagonistic.

Introducing the concept of basic rules involves a contingent approach to the management of rules. Since our main concern was to develop this concept, study activities where it was applicable and make proposals to remedy the breaches observed, a contingent approach to rules still needs to be developed, giving equal attention to complex and basic rules.

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APPENDIX A. GLOSSARY

CW: Consumer Waste

CMIO: Chief Medical Information Officer in charge of the MID

HRO: High Reliability Organizations

ICW: Infectious Clinical Waste

MID: Medical Information Department

MIT: Medical Information Technician

PHN: Public Health Nurse

PVC: Peripheral Venous Catheter

SAE: Serious Adverse Event

SRN: State Registered Nurse

SRK: Skill-Rules-Knowledge

STBCF: Systematization of Task-Based Constructive Feedback

APPENDIX B. SECONDARY DATA COLLECTED

Data collection was carried out in two phases, firstly during the phase when actions were proposed, and secondly during observation of the follow-up of the proposals. Tables B1 and B2 show the secondary data collected during each of these phases.

The external data shown in Table B1 relate in particular to the regulations regarding the tasks studied. These regulations were consulted at the start of the project and were used in particular to establish guidelines for the collection of primary data.

Table B1. Secondary data used to support the proposed actions

Case	Sources
Coding of diagnoses and interventions External sources	-Circular No. DSS/DGOS/MCGR/2011/395 of 20 October 2011 concerning the new regulations to control activity-based pricing of healthcare institutions. -Meah - Mission nationale d'expertise et d'audit hospitaliers ("National mission of expertise and audit in hospital") (2008a) Optimising the hospital billing/recovery chain - Experience feedback. -French ministry of labour, employment and health (2011). Methodological guide for producing information regarding medical activities and billing for medicine, surgery, obstetrics and odontology. Official bulletin No. 2011/6a, special section and provisional version of this guide (February 2014).
Internal sources	-Weekly summary tables of atypias -Doctors' monthly coding statistics and corrections by the MID
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Internal sources	-CoRe hospital management - Engagement letter of the peripheral venous catheter working party, June 2011. -Medical department* (2011), CoRe hospital. Summary of monitoring of peripheral venous lines of 9, 12, 18, 19 and 30 August 2011. -Medical department* (2011), CoRe hospital. Morbidity and mortality review, November.
All cases	-All of the data collected in connection with the research and initiative to transform the hospital and in particular that collected by means of a survey by means of a questionnaire. This survey was carried out in June 2012 and concerned all of the staff of the hospital. 1,000 questionnaires were distributed and 430 replies were used. -All of the minutes of meetings of the management during the study period

*The department's speciality has been anonymised.

Table B2. Secondary data regarding the tasks studied after the actions

Case	Nature of the data
Coding of diagnoses and interventions	-Weekly summary tables of atypias -Doctors' monthly coding statistics and corrections by the MID
Sorting of waste	-Results of the waste audit (dated 8 October 2013) -Monthly breakdown of waste sorting (ICW/CW), 2012 to 2014
Phlebitis	-Result of the flash audit conducted in February 2013 -Result of the flash audit conducted from 6 February to 17 April 2014 -Questionnaire regarding PVC good practice used in the flash audit in 2014 -Report on good practice for monitoring PVCs December 2014

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