

ABOUT: LOYALTY AND RESILIENCE

WHY A NEW VIEW ON HUMAN ERROR SHOULD FOCUS ON
THE DARK SIDES OF BASICALLY POSITIVE HUMAN
ATTITUDES

Thesis submitted in partial fulfilment of the requirements
for the MSc in Human Factors and System Safety

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September 30, 2008

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Under supervision of Prof. Sidney Dekker

ABSTRACT

The thesis examines on the ideological backgrounds of Safety and Accidents – High Reliability Theory (HRT) and Normal Accident Theory (NAT) and a new sight on both – the Control Value Square the necessity to balance Compensation and Resignation where first is related to HRT and later to NAT. The findings are deepened in taking a Depth-Psychological Perspective. This perspective shows that there are devils circles and self-preserving systems existing where especially under the influence of constraints or assumed constraints whatever group tends to install Steep Hierarchies. It states that this is done: first automatically and sub-consciously and: second in the hope that “strong leaders” force formalization, discipline and rigor and /or positive affirmations to handle these threats which is very like what High Reliability Theorists see as general needs for good company structures. This work shows the limitations and counter-productive potential baked in the basic (one-dimensional) premises of a pure HRT approach which is according this writing following an illusion – the illusion of control. This illusion is determined on a social level through an unleashed ask for Loyalty. Nonetheless Loyalty is from its core positive it gets negative when it’s “played” on the sharp end. The basically positive attitudes will and discipline are mutating to their dark sides then – to Conformism. Resilience as a quality is in this writing associated with the (multi-dimensional) premises of NAT. Resilience is seen as necessary counterpart for Loyalty – it stands for enmity on a social and relationship level which in turn implies that organizations to a certain point need un-conform (un-loyal) employees to guarantee an balancing of Production and Protection. This is not meant to eliminate hierarchy but as plea for Synergetic Hierarchies. Out of these considerations Resilience Engineering could be seen as the integration of the positive sides of both – NAT and HRT. The theoretical part of the thesis is brought on the base of three cases, the HAPAG-LLOYD Accident (2000), the general erosion of the standard Safety-First Policy, and NASA’s Shuttle losses, into practice. As sum-summary can be said: Opinion Leaders in the Human Factors and System Safety field like Sidney Dekker accent on the necessity to focus the question: “*who* are the ones holding the power in organizations?” – this thesis can be seen as trail to find answers for the *why*.

Die Diplomarbeit untersucht auf Basis der beiden ideologischen Grundlagen von Sicherheit und Unfällen – „High Reliability Theory“ (HRT) und „Normal Accident Theory“ (NAT) und einer neuen Sichtweise auf beide – dem „Kontroll-Wertequadrat“ die Notwendigkeit eines Ausgleichs von Kompensation und Resignation. Dabei ist erstere HRT und zweitere NAT zugeordnet. Die Untersuchung folgt einer tiefenpsychologische Perspektive die zeigt, dass in Gruppen, die unter dem Einfluss von tatsächlichen oder angenommenen Sachzwängen stehen, Teufelskreise und sich selbst erhaltende Systeme existieren die strenge Hierarchien ausbilden. Die Arbeit behauptet, das dies erstens automatisch und unbewusst geschieht und zweitens in der Hoffnung, dass „starke Führungspersonen“ durch Formalisierung, Disziplin und Strenge und /oder durch positive Affirmation dieser Bedrohung „Herr werden“. Beides entspricht aber auch dem was HRT Anhänger grundsätzlich als positive Organisationsform betrachten. Die Arbeit zeigt die Beschränkungen und das kontraproduktive Potential auf die aus den grundsätzlich (eindimensionalen) Prämissen eines solch reinen HRT Zugangs entstehen und behauptet, dass er einer Illusion folgt – der Illusion von Kontrolle. Solch eine Illusion verlangt nach hundertprozentiger Loyalität. Obwohl Loyalität grundsätzlich etwas Positives darstellt verwandelt sie sich durch diese Eindimensionalität zu etwas Negativen. Die Schattenseiten von Wille und Disziplin und damit Konformismus werden sichtbar. Die Qualität von Resilienz, die, laut dieser Arbeit, ideologisch mit den (multi-dimensionalen) Prämissen von NAT verbunden ist wird als Gegenpart für Loyalität gesehen. Resilienz steht für die notwendige Gegnerschaft auf einer sozialen und Beziehungsebene was wiederum impliziert, dass bis zu einem gewissen Punkt nicht-konforme (unloyale) Mitarbeiter gebraucht werden um die Balance zwischen Produktivität und Sicherheit zu garantieren. Damit ist allerdings nicht das Eintreten für die Abschaffung von Hierarchie gemeint sondern das Auftreten für Synergetische Hierarchien. Aufgrund dieser Betrachtungen kann „Resilience Engineering“ ideologisch gesehen als eine Integration der positiven Aspekte von beiden – NAT und HRT gesehen werden. Der theoretische Teil dieser Arbeit wird durch 3 Fallbeispiele, den HAPAG-LLOYD Unfall (2000), die grundsätzliche Aushöhlung der „Sicherheit zuerst“ Philosophie und den beiden NASA Raumfahrtunfällen, praktisch dargestellt. Als „Kurzzusammenfassung“ kann gesagt werden: Meinungsführer im Feld von „Human Factors and System Safety“ wie Sidney Dekker betonen die Wichtigkeit der Frage zu beleuchten: „*wer* sind die, die in Organisationen die Macht haben?“ – diese Arbeit kann als Versuch gesehen werden herauszufinden *warum* sie sie haben.

ACKNOWLEDGEMENTS

I want to say thank you to both – Friends and Family – who supported me on very practical and emotional levels, to make my success in this Master Program happen. A special thank is addressed to the two men who gave me, the not so “traditional” student, the trust and opportunity to participate – the President of School of Aviation at Lund University, Johan Lundström and Sidney Dekker, my Professor.

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INTRODUCTION

Loyalty (from French: faithfulness) is defined as: “hold on to fixed agreements, to observe the law and/or to show faithfulness in front of authorities and it is often used in the sense of reliability and proper ness towards the group one belongs” (source: Wikipedia). Additionally it’s an expression for staunchness or steadfastness which means: “Loyalty in the face of trouble and difficulty” (source: The Free Dictionary). All these features are a need for every organization. They are filling the hierarchical structure and determining direction through clearness and trust. We can assume that Loyalty is a main ingredient for every, good working social structure – it creates steady and satisfying relationships.

Resilience is generally the ability to recover from (or to resist being affected by) some shock, insult, or disturbance (source: Wikipedia). In the context of Human Factors and System Safety, using the term Resilience Engineering, Eric Hollnagel (2006) in his correspondent book states: “The performance of individuals and organizations must at any time adjust to the current conditions”. But how should these performances practically look like to fulfil these adjustments? It’s hard to imagine that they could be one-dimensional. They must be “somehow” multi-dimensional – various, flexible, colourful, creative...

And at this point it contradicts with Loyalty. Loyalty is from its basic definition one-dimensional – it’s towards something ore someone – an idea or a person. What means it excludes others. One has to decide if he or she is following – let’s say a left *or* a right direction. Loyalty “creates” hierarchies and hierarchies “lives” from Loyalty and once decided which direction to go, to stay on track, means to show discipline. Scott D. Sagan (1993) states that there is a dark side of discipline existing – so to say a too high grade of discipline forced by (too much) Loyalty. I think it’s a useful description to call this dark side – Conformism.

I am coming basically from a technical background but spending most of my professional life in the psychological and psychotherapeutic field. And I also was involved in Human Factors Training for High Risk Environments the last years. In both my interest considered deepening questions about inner- and interpersonal phenomena’s. One I believe that’s central is the existence of the Sub-conscious – what was *the* exploration of the “father” of Depth-Psychology – Sigmund Freud. Freud (1921) in his book about Mass-psychology extensively explains the team play between Conformism and the Sub-conscious. Latter is, so to say, the helping hand from the psyche for the first. The reason to do so is to avoid automatically (without ones knowing) the negative feelings e.g. fear, anger or shame of inner- and outer conflicts (Loyalty-conflicts).

I am personally convinced that positive answers towards the increasing of interactive complexity of modern organizations highly demands the increase of collective knowledge about the complexity of humans psyche. So the main intention of this thesis is to integrate expertise based on Depth-Psychology¹ into the considerations of a New View on Human Error.

¹ With “depth psychology” is meant in this context the psychology, that works with the concept (or existence) of an unconscious mind and *not* the substitute word for Alfred Adler’s Individual Psychology or Freud’s Psychoanalyses (which are both psychotherapeutic treatments)

ORIGINS

Previous Research

The whole examination on the theme is not brand-new in the safety field. So e.g. the problem of conformity¹ is part of the manual for pilot's training where is written: "People like to conform since non-conformity is stress-inducing." The manual teaches that pilots are endangered "to meet what other people expect from them rather than giving the correct response"² The common advice how to deal with this phenomena is to avoid Complacency – where one definition is: "Low index of suspicion" (Wiener, 1988). The convolute teaches further on: "*A good aviator* [...] admits that there is always much to learn" (emphasis added).³

There are two problems about the (mechanistic) Complacency approach. First: It hands the "problem" over to the individual – someone is (or was from the hindsight) to ok with a situation. He or she didn't (enough) rethink or re-ask. But the interesting point is not *what* individuals were doing! The question is *why*? What was behind? Which context? Which group dynamic and which culture? What leads to the second and for this thesis even more interesting question: What if Depth-Psychology is right and Conformism is showing up sub-consciously – without ones knowing? That would confute that people are acting conforms because they "like" to do so (which would imply that they are aware of it). What if it happens automatically? How should he or she be a "*good Aviator*" then? Without knowing that there is a problem existing there is nothing to learn about. Indeed a frightening circumstance.

There is very few science about these kinds of phenomena's existing. Despite searching in the net and different books and articles it is nearly impossible to find convolutes concerning Human Factors and System Safety that are explicitly focussing on the Sub-Conscious and knowledge from Depth-Psychology. One exception is Diane Vaughan's focus on pre-rationality in the chapter "Culture of Production".⁴ But also in her writing it's striking that it is apparently difficult to draw the line how far one in the context of System Safety should go. Vaughan brings to describe conformity on one hand Hannah Arendt's "Eichmann in Jerusalem" into game on the other she argues that focusing this kind of "power over" system (Nazi regime) doesn't bring the considerations further.⁵ Also on different Websites concerning Resilience where a huge amount of papers and articles are online the term Sub-Consciousness is practically not exciting.⁶

Scientific Approach

Following the statement of the prominent "Resilience Engineer" Nancy Leveson (2007): "Understanding and preventing poor decision making under the conditions of uncertainty requires providing environments and tools that help to stretch our belief systems and overcome the constraints of our current mental models i.e., to see patterns that we do not necessarily *want* to see." (Emphasis in original) the research question is: *What are (useful) Tools for Resilience Engineering to overcome the Constraints of our current Mental Models?*

¹ the thesis opts on the term conformism

² Jeppeson Manual, 2001, p. 12-10

³ Ibid, p. 15-6

⁴ The Challenger Launch Decision, 1996, pp.196-237

⁵ Ibid, p.407

⁶ e.g. "resilience-engineering.org" or "rs.resalliance.org"

Scientific Hypothesis

It is possible to draw a plausible picture about the inevitable Interdependency between Loyalty (and its subconscious drivers) and Resilience.

or with other words

Resilience Engineering without taking the phenomena “the Subconscious” into account is simply impossible.

Research Path

The Research-Path is following a qualitative approach and is divided into two chapters:

- a.) Theoretical – to examine the ideological backgrounds of Safety and Accidents – High Reliability Theory (HRT) and Normal Accident Theory (NAT) from a depth-psychological perspective which leads to a “Resilience - Loyalty Continuum”.
- b.) Practical – to deepen the considerations on the base of following three cases:
 - The HAPAG-LLOYD Accident 2000 in Vienna / Schwechat
 - The Erosion of *the* standard Safety-First Policy by promising “On-time arrivals”
 - NASA’s Shuttle losses – Challenger and Columbia

Expected Results

The foundational analysis of this thesis hopefully helps on to way and fulfils the requirements of what Dekker (2005) says about Resilience Engineering: It should “add a new level of intelligence and analysis to the “incident” reporting and error counting that is done today”.

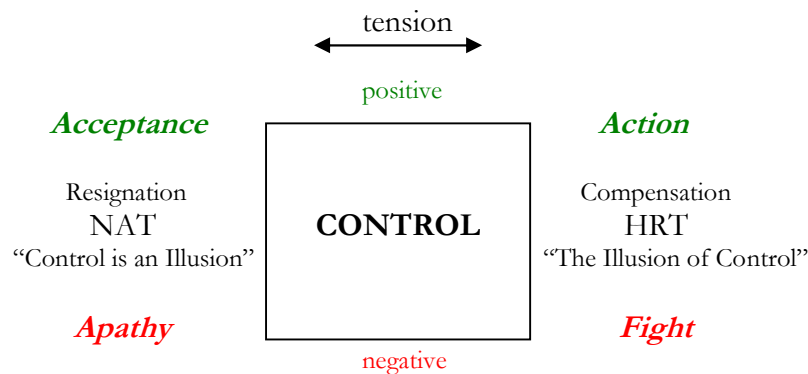
THEORETICAL

HRT and NAT

High Reliability Theory (HRT) can be seen as a theory of *Compensation* – one can “make it” if he/she is clever enough and if he/she (really) wants. It focuses on humans will, on motivation and the ability to succeed. So it’s strongly *positivistic* and hope-inducing, based on the premise: “work hard and learn and you will make it”. There is (on the first sight) nothing bad about – it’s great if one have positive attitudes towards his/her job. And for sure that brings to *a certain point* great benefits for both – the employee and the organization. The problem is the one-dimensionality inducing an “*Illusion of Control*”.

Normal Accident Theory (NAT) looks at the first place (or can be interpreted) as a theory of *Resignation* – bringing the impossibility, the fail, the fate and even the sub-consciousness (“something” that drives our behaviour without our knowing) not only into game but gives them a prominent place. That’s (understandable) frightening and resistance inducing. Probably this resistance is a main reason why NAT is connoted as *negativistic*. One could interpret this connotation as “revenge” from HRT followers towards NAT’s postulating “*Control is an Illusion*”.

Control Value-Square



Tab. 1

Felsenreich, 2007

The Control Value-Square¹ states that the two *positive* attitudes for CONTROL (acc. NAT and HRT) are *Action* and *Acceptance*. They are standing in opposition and in a tension to each other. Following the idea of a “value square” to keep their positive “charge” one *must* be integrated into the other. There must be a balance between a good amount of Compensation and Resignation. Otherwise (if one is getting to strong – if it’s “played” on the sharp end of the continuum) Action or Acceptance are falling to their *negative* attitudes for CONTROL *Apathy* or *Fight*.

¹ Friedemann Schultz v. Thun (1989) uses the value-square to explain his communication model. He puts the positive attitudes of communication – *truthfulness* and *effect-awareness* into opposition. The negative corresponsive terms are *bluntness* and *façade*.

That can sound on the first sight strange. What to see positive in Resignation and what's bad about *Fight*? But Resignation can have a positive effect – to not launch, to not start or land – to “produce” a go around or to cancel the landing airport and fly to an alternative and so further on. This means to give up the (initial) intention. That's, if it gets positive connoted, *Acceptance* then and doesn't mean (necessarily) to fall into *Apathy* (to give up at all). It makes one (or a group) free to find Alternatives to come into *Action* again and into a (good, safe) balance in-between those two (positive) antagonists.

The problem in definition but also in practice is deeply baked into the highly achievement, western oriented society. This superlative and winning-adoring socialisation causes *Fight*-orientation and identification. Winners are the role-models who are defined as ones with a strong will (you can get everything if you *really* want) being able to actualise even impossible seeming things. This is seen as the major difference towards non-winners. So it's a general tendency then to connote already (hopeless) fighting as (only) positive acting while downgrading is seen as giving up – as something only losers do. According this socialisation and the linked belief systems people (the winners!) don't want to focus on what is not possible but on what is possible.

Motivation Trap

Motivation Trap is the term that states that this one-dimensionality out of “More of the same” can get counterproductive. To *a certain point* motivation really helps – the assumption to have control and to do everything to stay in control helps because it empowers oneself (or a group). This empowerment indeed brings “positive energy” to be successful (and to avoid failures) in operation. Nonetheless motivation stays one-dimensional. At this *certain point* the positive attitudes unfortunately gets counterproductive (from its basic ideology) because *Acceptance* for uncertainties (technical, organizational and social) is not baked into the concept – what causes a (fatal) denying of practical limits. To *Fight* and “Drift into Failure”² is the logical consequence. As assumption can be said, that the Motivation Trap is internal determined through an unleashed think positive myth and external through an (un-winnable) trail to make the impossible, possible.

² ”Drift into Failure” is a term based on the ”Theory of Practical Drift” in Scott A. Snooks book ”Friendly Fire”, 2000, pp. 179-201

Depth-Psychological Perspective³

Its not about will

To deepen the picture of the limitation of an pure HRT approach and to search for "new levels of analyses" the following content is crucial. One of the main representatives of HRT – Gene I. Rochlin (1999) refers in his article "Safe operation as a social construct" lastingly about the importance of reflexive and self-conscious learning.^{4,5} But it's simply impossible to learn about social interactions by not taking the Sub-Conscious into account. That's even on a theoretical level obnoxious. What's the core of *reflexive* and *self-conscious* learning? It is to make something conscious that wasn't conscious before.

Rochlins path is following exactly what Morgan (1985) calls the "Myth of Rationality" which: "helps us to see certain of action as legitimate, credible, and normal, and hence to avoid the wrangling and debate that would arise if we were to recognize the basic uncertainty and ambiguity underlying many of our values and actions."⁶ The deep will of individuals and groups to keep up the "Myth of Rationality" what is with other words "The Illusion of Control" is from a psychological perspective very understandable – it helps to stabilize and structure the inner and outer world. That's not bad per se – rationality is a need but gets (like pictured in the Control-value Square) at a certain point counterproductive. It denies and excludes individuals personalities and the interaction between those (group-dynamics) and so the counterpart of rationality – emotionality.⁷ The integration of emotionality means to follow an holistic approach. And this is not a path of (cognitive) *will* – this is a path to create (emotional) *space*.

To take up a Depth-Psychological Perspective means predominantly to deepen the NAT theory but should be also of help to understand the basic existence of those two strong oppositional belief camps and the hardness to overcome the "Motivation Trap". To do so it is necessary to focus on the two levels of the Sub-Conscious.

Individual Level

Important terms to understand the Sub-Conscious are the so called Defensive-Mechanisms (Freud, 1937).⁸ Those Defensive-Mechanisms, like repressing, denial or splitting of "unwanted" cognitive *and* emotional contents, are the more important the more "pressure" is on the psyche. This is meant external *and* internal. Latter is linked with ones belief-systems⁹ first with ones surrounding. Both are crucial for ones constituting his or her reality. With surrounding is meant the social system – the culture where the individual is part of. For the organizational context as the core can be defined: "The higher the hierarchic gradient the more the individual is endangered to fall back into his or her Defensive Mechanisms".

³ These basic descriptions of Depth-Psychological contents must be seen as simplification. The intention is to distillate out of a very complex theory the most helpful terms into some paragraphs.

⁴ p. 1552

⁵ The same one-dimensional and positivistic approach can be seen in Rochlins et.al article: Self-Designing High Reliability Organization, 1987

⁶ Gareth Morgan, Images of Organization, p. 135

⁷ Its common accordance in Psychology that thinking without feeling is impossible – it's a unit.

⁸ Sigmund Freud was the first person to develop the concept of defence mechanisms, however it was his daughter, Anna Freud, who clarified and conceptualized them.

⁹ Belief-systems are acc. Depth-Psychology learned features (dos and don't dos).

The underlying problem is the “cleverness of the psyche” to protect ones lower ranks integrity, security and status (self-picture, income, role). This “cleverness” makes it happen that humans who, under other circumstances (synergetic hierarchic structure), would follow their (normal, healthy) impulses and *feel* resistance towards different inconsistencies (like threats) stays silent. So individuals are not standing up and saying “no” but automatically (without their own knowing) through the inner process of this Defensive-Mechanisms signalise ok’s for basically un-ok situations. This follows the statement of Felsenreich (2007): “We only *understand* if we *stand* the (then following) consequences”

Collective Level

Following the famous sentence of Watzlawick et al. (1980) for individuals: “One cannot not communicate” it can be said for groups. “One cannot not get into relationship”. Relationships happens if we want or not – on private *and* professional levels. The quality of those relationships is strongly linked with the *space* that’s inherent – means if people are aloud (from internal and/or external) to express freely their thoughts *and* feelings towards each other. With other words – if the specific relationship is determined through an “Adult to Adult” level of encounter.

This leads to another two important terms from Depth-Psychology – Regression and Transference. On a group level not functioning “Adult to Adult” relationships are determined through (typically) one slipping into the Parent and the others into the Child role. Doing so, the behaviour of latter is named Regression. But Regression is also the mode where the Defensive Mechanisms are settling in. This is crucial to understand because this “unwanted” cognitive *and* emotional contents described above are only stored in the Sub-Conscious, what means that these contents are not “gone”. They are “working” in the background and “produce” what Depth-Psychology is naming Transferences.¹⁰

Transferences are very problematic because of this inability of negative thoughts *and* feelings to disappear. So they are “normally” transferred (sub-consciously) to other (non-involved¹¹ or involved) persons¹² who are detected as ones who are *not* able to endanger the integrity, security and status. But according this “cleverness of the psyche” it gets even more problematic. Not only that those feelings *and* thoughts are not addressed onto the right persons Transferences additionally (and also sub-consciously) reverse the situation. This means that on one hand not negative but positive thoughts *and* feelings are transferred onto the one (or ones) in the parent role and on the other that negative thoughts *and* feelings are transferred onto persons (colleagues) who tries to confute this dynamic by speaking up. The outcome of these Transferences induces for the system a devils circle where automatically (sub-consciously) the power and control of the leaders (parents) is increasing and the power of the subordinates (child’s) decreasing. The essence of this self-preserving unbalance caused by the whole bundle of Transferences can be defined as Collective Sub-Consciousness – what in turn “creates” Conformism.¹³

¹⁰ In Depth-Psychology Transference is a Defensive Mechanism by its own – here it’s used as an umbrella term

¹¹ Transference classics towards non-involved persons are: One has troubles in her job and transfers her anger onto the life-partner. Or very actually – one loses money through speculation on easy markets what increases his hatred against refugees in his country.

¹² The dilemma is, that if they are not transferred to others they could easily get self-destructive (e.g. depression)

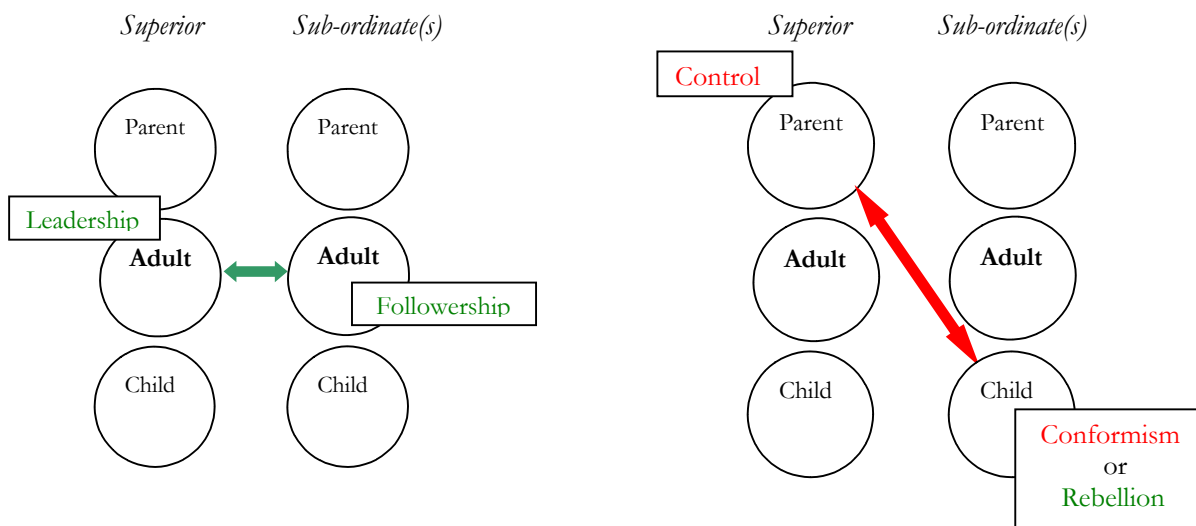
¹³ This follows the perspective from bottom up. So the hen or egg question is rising up. Are people acting conforms because they are facing strong hierarchies or do they constitute them by their conformist behaviour? But from the perspective of this thesis the activators for these negative group-dynamics are the constraints from outside, anyway. So at last it doesn’t make any difference what comes first – the thesis intention is mainly to bring light into people’s interaction and to understand the psychological background of constituting leader- and follower ship.

Transactional Analysis

Transactional Analysis, a basically depth-psychological theory developed by the psychiatrist Eric Berne during the late 1950s, is a tool which pictures the writing above in a psychological model. It focuses Human Relationships and helps to *analyse* people's *Transactions* according their so called Ego-States.¹⁴ With Transactions is meant the communication and behaviour caused by thoughts and emotions between humans or groups of humans. The Ego-State model categorizes peoples psyche into an Adult, Child and Parent level. Simplified it can be said:

- Parent Ego-State – Level of thinking (Rationality)
- Adult Ego-State – Level of integration (*Conscious* level of thinking *and* feeling)
- Child Ego-State – Level of feeling (Emotionality)

Transactional Analysis states that Transactions which represents a functioning relationship between adult people should be – independent of their role as leader or follower(s) on an “Adult to Adult” level. This doesn't deny the necessity of hierarchies and additionally it doesn't say that the Parent Ego-State or Child Ego-State is negative per se – on the contrary – hierarchies and leading are a need and a certain amount of parenting (controlling) the Sub-ordinates is necessary for good Superiors. Also a certain amount of “childish” trust is good for Followership but both should be integrated in the Adult Ego-State. With integration is meant, that the inherent thoughts and feelings (also the negative ones) are conscious and there is on both sides awareness and shared definition about the different roles – which represents *space* for reflexive ness and so *absence of Transferences*.¹⁵ This also includes, that Leadership is determined through competence and not through personal ego (leading should be mainly something giving). This can be named then a Synergetic Hierarchy.



Tab. 2: Synergetic Hierarchy vs. Steep Hierarchy

Steep Hierarchy is highly determined through the *presence of Transferences* and *no space* for reflexive behaviour. The Superior has the (boundless) power and control over the Sub-ordinate(s). Latter are forced to act conforms or rebel against the Leader and the system.

¹⁴ Eric Berne, *Games People Play – The Psychology of Humans Relationships*, pp.23-32, 1964

¹⁵ With absence is meant minimized Transferences – they are always valid in Humans Relationships

It needs an enormous amount of ones personal “rebellious”¹⁶ – means (inner and outer) *not* conflict-avoiding “power” to not behave conforms in a steep hierarchical system. The consequences for so called “Whistle-blowers” to do so are horrendous. The German psychotherapist and author Heinz Peter Röhr (1999) states that: “one has not only the boss as opponent but the whole followers system.”¹⁷ Based on the Transferences following group-dynamic settles in: Conformists, fulfilling the will of Superiors, are not fighting against the problem they are fighting against Whistle-blowers who points onto the problem.

Out of *these* group-dynamic, rebels are out of *the* group-dynamic. Means – the steeper the hierarchy the more they are practically chanceless – basically in such systems the never get into positions were they have something to say anyway (conformist followers are the ones getting credit) and if they are already in a higher position their (inner and outer) conflicts gets so strong that they resign (gets conforms), get fired or quitting out of their own will. And that’s indeed *the* drama for a system. It gets – step by step rid of their ability to reflect their actions. A self-reflective culture is determined through people who asks non-conform questions – otherwise it gets pseudo-reflective – and drift into failure is a logical consequence.

The drivers for *the* drama are also deeply baked into the society and so into the Collective Sub-Conscious and can be seen generally in the interactions and relationships of “normal” low-rank people (hirers, employees, electors, spectators, fans ...) towards their high-rank leaders (owners, manager’s, politicians, stars...). The Depth-Psychologist Erich Fromm (1968) explains lastingly the core of these often ambivalent but in its base stable relationships. It’s the powerful attraction “normal, healthy” people (mostly with the tendency to have self-doubts) feels towards ones with omnipotent self-pictures (which leads to a remarkable self-confidence to grasp the power) and the tendency of firsts boundless trust into the “excellence” of latter.¹⁸

The modern world with its increasing speed and complexity additionally creates instability. Also from this perspective are the strong dualistic Transference surfaces “Hero” (strong Leader, rescuer, role model ...) and “Anti-Hero” (Whistle-blower, culprit, scape-goat...) explicable. First to transfer (or project) hopes and dreams, latter to transfer frustrations (anger and hatred sourced from sub-conscious anxieties) onto. The “Heroes” can be named with the umbrella term (Super) Father-figures.

Who are the humans in these roles of (Super) Father-figures then? This can be also answered with the theories of Transactional Analyses. The major exponent Thomas Harris (1967) ¹⁹ argues convincingly about the importance of “I’m O.K. – You’re O.K.” so called Life Positions as a base for functioning relationships, which is another expression for “Adult to Adult”. So this is what should be, but Harris states that the majority of humans have a tendency to lack self-esteem which is pictured in an “I’m *not* O.K. – You’re O.K.” Life Position and shows up through a bunch of Feelings and Thoughts that others are “better, smarter, prettier, more successful...” This can be painful on a personal level, induces Transferences out of the everlasting Child position and demands so “Heroes” but is in itself harmless because the ascriptions to the outer world are hope induced and so positive. What’s terrible problematic is the interaction with a minority of humans with a huge driver to fulfil these roles of the “Heroes” having a just opposite Life Position internalized – “I’m O.K. – You’re *not* O.K.”.

¹⁶ With rebellious is meant – and that’s for sure idealistic (there is always also egoism involved) to follow an approach were the rebels driver is not to come personally into the power-position (to plunge the leader) but to focus the wealth (the safety) of the whole organisation.

¹⁷ Narzissmus: Das innere Gefängnis, pp. 165-166

¹⁸ The Heart of Man: Its Genius for Good and Evil, German version, pp. 76-77

¹⁹ I’m O.K. – You’re O.K.: A practical Guide to Transactional Analyses, pp. 1-267

Transactional Analyses states that it's a very basic decision to develop an OK or a not-OK for others.²⁰ By that is meant that it gets "decided" by the very small child sub-consciously and it's linked if the child gets treated well or not. For those grown-ups with the latter "decision" it's then not possible to transfer libido (what basically means positive feelings) towards others anymore. This can be seen as a collective revenge for the suffering in the childhood and as compensation to never re-experience (this painful) dependency. Extremely pictured only the "I" and no "You" stays existent. The "You" is only focused if it supports the interests of the "I". The drama is that the trust towards others got lost and that no real relationships are feasible anymore. That's named then an "Anti-Social (Life) Script".²¹

An Anti-Social Script is strongly showed in the narcissistic personality (disorder). One of the most famous opinion leaders about personality disorders – the Professor of Psychiatry and Director of the New York Presbyterian Hospital Otto F. Kernberg (2004) describes people with a severe narcissistic personality as ones showing a remarkable lack of empathy and (deeper) emotional interest towards others. This chronicle inner emptiness induces an unleashed will to act superior as an everlasting search for an ego boost – but never getting filled or satisfied (its relationships that deeply vitalises people not fame). A paradox of a basically blown up ego but the need for ongoing ego boosts is significant. Out of this conversion narcissistic personalities gain their power out of competition and not of solidarity. With remarkable self-confidence and without any sense of indebtedness they assert a right to command and rip others off. Under a often smart and handsome facade there's something cold and inexorable.²²

Based on this disconnection of real emotions narcissistic personalities are mostly free of fear but also of compassion. Emotions are substituted by images. Those images make it happen to act "flexible" in various directions even if the contradictions are striking. Inconsistencies are seen as challenge ("every path of super minds is or was contradicted by ignoramus"). Out of this driver narcissistic personalities can be remarkable convincing in selling (whatever) questionable contents (demagogic features). On their everlasting quest for "the big feeling" they are following (whatever) superlative aims (richness, fame...) and are so totally goal oriented. People (even if they were long-time followers or "friends") gets scarified if they are not needed anymore or standing in the way. 100 % Loyalty is required – criticism is strictly prohibited.

It's common sense, that a lot of those features are highly wanted for organizations. Leaders, with strength and without fear (with expanded self-esteem) being goal oriented, acting rational (without mawkishness) and having everything under control, are mainly connoted positive. Those are the ones ready to execute "sharp decisions" which is seen as a state of professionalism and which is mostly defined as a need for innovative changes. So it's on the first sight paradox that what is detected from a psychological perspective as deficits is seen in the (real) world as strength. But deepening this subject also psychology is acknowledging the reality that narcissism as a personal style can have tremendous innovative power. Indeed, people who are (or were) driven by (unnatural, unhealthy) superlative pretensions following "fantastic" ideas brings (or brought) also positive progress into the world.²³ What borders a very fundamental and philosophical question: Is personal (and so collective) suffering the major impetus for innovation or are there alternatives?

²⁰ or the opposite around – if the child stops the basic OK that it has naturally – what would imply the existence of an basically "universal trust".

²¹ Building up a personality (or a personality disorder) is a pretty complex act. Basically it can be said that an Anti-Social Script, as every Life Script, can be "produced" as a reaction towards the social environment (through frustration e.g. pictured in Maslow's Pyramid) but also as something learned.

²² Aggressivity, Narcissism and Self-Destructiveness, German Version, pp. 76-80

²³ But even more often (looking e.g. to war-scenarios) it lead to terrible disasters for the involved human beings.

The key to the answer is probably lying in our collective sub-consciousness where thousands of year's tradition of adoring the suffering principle in a catholic – men dominated world is stored. It's even out of the range of our conception that a predominantly female lust principle with its integrative – trust-inducing power, following a joyful approach of curiosity, could bring us more benefits. Competition and winning are so self-confidently the dominant drivers in our (professional) world as the production of losers as an inevitable by-product. Heinz Peter Röhr (1999) states that we are living in a narcissistic society, where self love, which is the healthy essence of narcissism, is strongly perverted.²⁴ This is meant in both directions – the absence of self-esteem is as problematic as a blown up ego that's coming from the compensation of deep (sub-conscious) inferiority feelings.

From this perspective it's more understandable that narcissistic leaders *and* conformist followers are a product (and so both victims) of a greater systemic imbalance pictured in a male dominated society.²⁵ Although the intention of this work is not predominantly to focus on cultural history this is of high interest, because Human Factors and System Safety bring via the term “Protection” the female principle into game. These life-protective efforts are standing on an archaic level in the matriarchic tradition of life-affirming and life-giving. “Production” as the counterpart can therefore be classified as “male” following the patriarchal tradition of hunting and conquer with taking “collateral damage” to notice. It's basically a dualistic approach of culprits and victims, winners and losers²⁶ while “Protection” is following a holistic approach.

So a depth-psychological perspective on Human Error shows that in principle “Human Factors and System Safety” can be much more than “only” a tool for classified High Risk Environments. This view brings answers to various up-coming questions in organizations and even for the whole society today. In the language of Depth-Psychology it's an unbalance of male and female forces which causes these tremendous increasing (group dynamic) problems we have today where “unjust” behaviour determines (unfair) goals and competition levels. It makes the devils-circle visible and understandable – the ongoing and self-preserving loss of trust and lack of reflexive ness where anti-social behaviour becomes normative. From this perspective it's so to say the “Drift into Anti Sociality” which causes the “Drift into Failure”. As core and so as assumption can be defined: “The trail to understand failures in organizations leads automatically to deeper social issues – organizational misbalances *are* social misbalances.”

It's about relationships

The discussion about totalitarian leaders and their conformist followers and both personality problems is *not* a moralistic one. It is not about stigmatizing people. It doesn't say that filling a leaders position has only an antisocial background (denying that leading is also determined by expertise) it also doesn't say that followers are (as a personal style) “weak” per se but it does say that organizations under high constraints (or under assumed constraints) are pretty much endangered (sub-consciously) to assign the wealth to problematic personalities who installs Steep Hierarchies. This installation happens mostly out of noble intentions – to act in the best interest of the whole organization (in the hope to get control over constraints and threats). So it's about understanding why and how un-constructive action as a group-dynamic is settling in and why and how on a relationship level this gets automatically (sub-consciously) justified.

²⁴ Narzissmus: Das innere Gefängnis, p. 155

²⁵ With male and female principles is not necessarily meant humans sex – both men and women are caring male and female qualities.

²⁶ This dualism is also pictured in our legal system (guilty or not guilty)

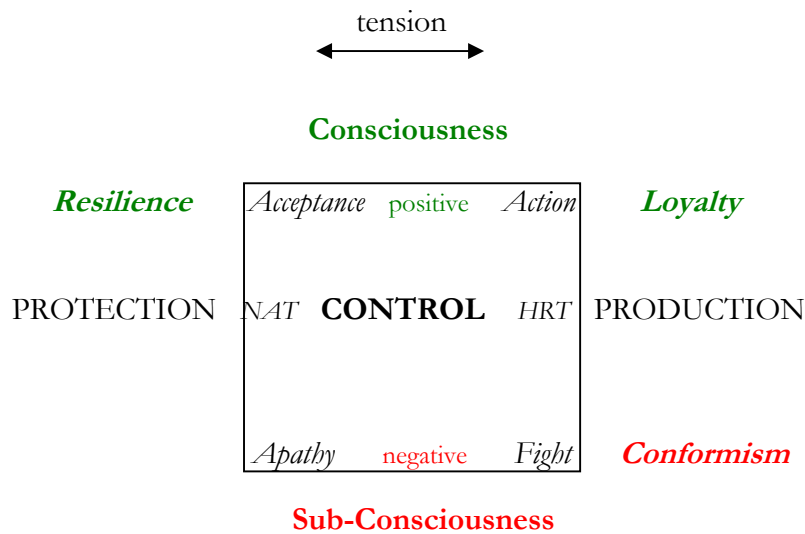
The *sub-conscious* process of constituting and running “Steep Hierarchy” relationships (*the dark side of will and discipline*) is universal: Constraints are detected as threats onto the organization – a loss of influence, autonomy, expansion goals, jobs... or the whole structure (entire company) is feared. As a *reflex* out of the collective anxiousness the need for a strong (and un-anxious) father-figure gets constituted. This figure announces to make success (even an impossible one) possible, if all low-ranks are following his (seldom her) instructions. He arrogates “closed ranks” and achieves goal orientation as highest priority. Times for reflecting the own behaviour or focusing other perspectives are then basically seen as a waste of resources. But also a pseudo-reflexive ness is common, where the resources for reflecting are applied but from the beginning the outcome of these considerations are clear (they are following the interest of the super ordinate goal represented by the superior). Whistle blowers are seen as a burden – as a handicap on the collective way to success and as a threat for the “morale” of the group. The system is pseudo-self-worth promoting – social closeness is constituted by fear and determined through one-dimensionality and dualism – a Culture of Conformism is established.²⁷

The *conscious* process of constituting and running “Synergetic Hierarchy” relationships (*the bright side of will and discipline*) is also universal. Even under high constraints the organization is aware of “the Illusion of Control” which means that the collective feels the reflex for “closed ranks” and quick fixes but is developed enough to *reflect* this reflex. It’s generally appreciated then, that the most needed resource for reaching sustainable goals are working relationships which are not only determined by yes’ but also by no’s. A certain amount of enmity is wanted and so dissent encouraged and awarded. Autonomous from rank an “Adult to Adult” level of encounter is guaranteed – people are taken serious. Empowerment of people (power-sharing as much as possible) is seen as source which creates positive active systems allocating space for individual strengths and the balance of different interests through bundling the (healthy) social feelings in the interest of all involved humans. This creates fairness and collective accountability. Basically an path of synergy is following the paradox of the saying: “If you’re in a rush – go slowly” which means that especially under high stress it’s necessary for good decision finding to create space for diversity and negotiation. Power-sharing is seen as a working tool for knowledge-sharing. Nonetheless hierarchy stay untouched (it’s about balancing power not elimination). After an adequate process of decision finding, decision making is lying in the hand of the leaders – those are the ones holding responsibility. Decision-markers are made as transparent as possible but even from those Sub-ordinates staying sceptical, acceptance for the constituted reality and support in execution is demanded. This system is (real) self-worth promoting – social closeness is constituted by trust and determined through multi-dimensionality and holism *and* hierarchical clearness – a Culture of balancing Resilience and Loyalty is established.

²⁷ The essence of these (relationship) phenomena’s are already described in the year 1921 in Freud’s book about Mass-Psychology – Paradox (and ironically) Freud states that the term “Love” plays an prominent role in constituting steep hierarchies. When leader and idea get identical the love of the archon constitutes sense and companionship in the “infantry” which have in return a collective libidinous (love) relationship towards him (very seldom towards her) and those who are “outsiders” get collectively treated loveless - Massenpsychologie und Ich-Analyse, pp. 48, 49, 55, 58

Resilience - Loyalty Continuum

Control Value-Square expanded



Tab. 3

Felsenreich, 2008

The *Resilience - Loyalty* Continuum and the necessity of balancing both terms can be pictured in an expanded Control Value-Square. It's so to say a compendium of what was said under the headline "Depth-Psychological Perspective" and an apposition to the headline "HRT and NAT". Following the basic idea of the Value-Square (see also p.10) it gets seen that *Loyalty* needs as a counterpart *Resilience* because otherwise it would fall to its negative specification – *Conformism*. The term *Resilience* is in this context the "store sign" for Protection. According what's said before it has matriarchic roots – it's round and holistic and gains its power from integration. In opposite *Loyalty* is patriarchal – its linear and dualistic gains its power from exclusion and stands for Production.

Thinking further it gets clear that Production and Protection are really two different things. One cannot "produce" Protection – it's not possible to construct it (especially not as one-time event) into a organization. It's an ongoing process which makes Protection happen. So in the expanded Control Value-Square there are not predominantly the terms *Resilience* and *Loyalty* standing in opposition but the qualities of both terms. This perspective also shows then that Reliability and Safety are not the same qualities. Focusing this (and following the idea of the Value-Square) pictures the paradox that an organization gets reliable (and safe) if it is not trying too hard to be reliable – that "everything" is about balancing which means on a social level to balance (rigid) will and (flexible) space or *Loyalty* and *Resilience*.

An in-balance in aid of *Loyalty* produces *Conformism*. The dark sides (the too much) of the basically positive and *Loyalty* building "will" and "discipline" are showing up. Both are from its effect the same. The (sub-conscious) will of the Superior get (sub-consciously) transferred onto the Sub-Ordinates. Those are (as well sub-consciously) fulfilling this will of the leader perceiving it as there own will. So the necessity of Consciousness building processes and the header: "Why a New View on Human Error should focus on the dark sides of basically positive Human Attitudes" are pictured through this expanded Control Value-Square.

Nonetheless this writing is predominantly focusing Protection one fact should be deeply emphasized. Production is and stays (in any case) the base – the reason and sense why even Protection is needed. Protection cannot stand for its own. 100 % Protection would mean in general to give up from the beginning (e.g. for an airliner to let the planes grounded what is for sure nonsense). This is also in the Value-Square connoted negative – as *Apathy*. What sounds on the first sight evident anyway is pretty important because theory building should be of value for daily hands on work where the preconception “Protection is against Production” is still common. So the Value-Square should be also of help to overcome barriers and be a reminder that the core of Protection is not to hinder but to support (sustainable) Production.

Marais, Dulac & Leveson (2004) are in their article “Beyond Normal Accidents and High Reliability Organizations” lastingly arguing for “the need for an alternative approach to safety in complex systems”. Following the perspective of this work an integration of the two models HRT and NAT could be an innovative step. The positive aspects of these both, from its bases bi-polar different ideologies, would be (according the Control-Value Square) brought into balance. That would determine an (ongoing) process (for whatever context) to define the “certain point” which means to find a (good) balance between *Action* and *Acceptance* (see also p. 11). So it’s possible then to overcome on one hand the negativism of NAT and on the other the un-realism of HRT. This would be of great help to run high performance systems but to avoid “Motivation Traps”. So theoretically Conformism and the dark side of will would be eliminated and substituted through the bright side of them.

This is also, from the sight of this writing, what Resilience Engineering is about – an ongoing process to balance Production and Protection. While Resilience Engineering is not based on a solid theory anyway maybe this could be one. In the end its a trail to balance the very basic Weberian and Durkheimian²⁸ considerations which looks like are (and maybe will be forever) a general theme in understanding, building and runing social *and* economic structures. So the suggestion is that Resilience Engineering could be seen as a theory where: NAT is the background on which HRT should operate!

Resilience Engineering

Quoting Hollnagel, Woods & Leveson (2006) one major approach of Resilience Engineering is to come “from Reactive to Proactive Safety”.²⁹ Another expression for this is Woods (2003) “Creating Foresight”. Under this header Woods state: “The critical role for the safety group within the organization is to monitor the organization itself – to measure organizational risk – the risk that the organization is operating nearer to safety boundaries than it realizes”.³⁰ From the perspective of this work the only way “to monitor the organization itself” is to understand people’s relationships and the group dynamics that lead to those relationships and let it run. So it’s maybe possible to find other wordings and/or ideological emphasis but it’s impossible to *not* focus onto the core of what’s said above.

²⁸ Max Weber and Emile Durkheim were both sociologist born about 1860. Durkheim insisted that society is more than the sum of its parts and is so the creator of one of the first scientific approaches to social phenomena. Unlike his contemporary Weber, he focused not on what motivates the actions of individuals, but rather on the study of social facts, a term which he coined to describe phenomena which have an existence in and of themselves and are not bound to the actions of individuals. So Durkheim can be seen as one seeing in organizations the critical aspect of constraints and obligations, while Weber is connoting the rational power and authority through rules (law and order) as something predominantly positive, as worth pursuing or even indispensable necessary on a way to organizational success.

²⁹ Resilience Engineering: Concepts and Precepts, p.3

³⁰ Creating Foresight: How Resilience Engineering can transform NASA’s Approach to Risky Decision Making, p. 1

This (self-conscious) statement says that an organization who wants to install resilience structures must assure space for peoples individual will and individual ideas. Such organizations must follow the principle that the most important source to identify threats is the organization itself. They have to appreciate that power sharing *is* knowledge sharing and that (safety) groups and/or individuals (according to their position) can only be active in finding innovative solutions if a certain amount of enmity is not only wanted but (top - down) enforced.

Those Safety Cultures baked into the whole organization need to constitute and run Synergetic Hierarchies. Its inevitable then to focus: “Who has the power and why?” and on what Dekker (2007) says: “Who in the organization [...] gets to draw the line between acceptable and unacceptable behaviour?”³¹ This is necessary on the way to detect which group dynamic and which social constructions the organizational culture is establishing. Taking this path should be not seen as general challenge for those in the leader’s role but as tool to balance power. What for sure demands leadership that is determined through an good amount of (positive) self-esteem, were the Superiors have the emotional stability and reflective ness do don’t feel plunged by controversial social interactions.

An ongoing process of professional organizational development is seen then not only on content- but also on psycho-social levels. Safety groups or Safety Departments are then in the role of equitable partners face to face with other managements and are endowed with enough power to foreclose negative developments e.g. in-house incentive schemes related on safety issues. Out of this mindset the whole organization appreciates that error management and reporting systems are tools to support innovation. Both are seen as a need to dig deeper into the discovery of systemic vulnerabilities.

To make this happen incident reporting must be done in a style what Iedema et al. (2005) calls “Narrativizing Errors”.³² Those narrations brings problems to light in a non-blaming way which might be morally satisfying and perhaps even therapeutic. What makes new spaces for the apprehension, identification and performance of self available, so the incident report is a space where employees publicly perform concern about what happened. The incident reporting becomes so the basis for radically altering the employees / organization relationship. This is how humans are taken serious. This is how trust is built. But this is also how organizations “reality” is found out.

With organizations reality is meant the summary of all individual realities because at last, reality stays something individual. Already the theory of the transferences (see p.13) which automatically includes counter-transferences³³ shows that there is no alternative then to accept human’s subjective ness. It is to add that (humanistic) psychology states that feelings of individuals are always “real”. What doesn’t necessarily mean that they are understandable or even appropriate to the (visible) context. But acknowledging ones reality and engaging him or her to share feelings is a deep chance for (whatever) social context to learn. Ones e.g. fears are a puzzle stone to understand the greater picture (e.g. the group dynamic). So is the path already the goal. This path induces, in opposite to all the devil-circles described above, positive circles. If people begin to share deeper issues the relationships gets deeper. Deeper relationships gains more trust. More trust gains more bonding – and more bonding gains more (means appropriate) accountability. What represents a win/win situation for every organization.

³¹ Just Culture: Balancing Safety and Accountability, p. 119

³² Narrativizing errors of care: Critical incident reporting in clinical practice. Social Science & Medicine 62, p.134

³³ The term Counter-transferences is the expression for first: transferences are running vice versa. Second: those transferences that are reactive to the ones of the oponent. Third: the transferences from high ranks towards low ranks. There to differentiate is of interest because the roles have already inherent transference schematas.

This is the only way from the perspective of this convolute how in practice sub-conscious contents about constraints and threats can get made conscious. It's so in opposite to Rochlin's Self-designing organizations (see p. 12) not a linear risk-management of will that brings success but a Self-balancing organization style with a holistic risk-management of space. In that it's not a particular heroic³⁴ act of humans (or groups of humans) to avoid disasters but the multiplicity of small ongoing heroic acts of the collective which, with Hollnagel's words from the introduction, adjusts the performance of individuals and organizations at any time to the current conditions. Resilience Engineering avoids what Snook (2000) describes as Pseudo-Teams³⁵ and is so a guarantor for Real Teams.

³⁴ An example, but *not* a positive one to show how difficult it is to overcome the collective addiction on "Heroes" is the new book (date of publication December 15, 2008) of one of the opinion leaders in the Human Factors field – James Reason – with the title: "The Human Contribution: Unsafe Acts, Accidents and Heroic Recoveries". According the synopsis: "The purpose of this book is to explore [...] both the reliability and resilience of complex well-defended systems [...] there is another perspective [...] the human as hero, a system element whose adoptions and compensations have brought troubled systems back from the brink of disaster" Reason ask: "What, if anything, did these heroes have in common? Can these abilities be "bottled" and passed on to others?" This approach is from the perspective of this work highly reactive and so absolutely not what (proactive) resilience in its core means. Resilience is not about "saving a ship from sinking in the last second". It's great if it happens but the (disillusive) reality is that this is rarely done out of will or cleverness but often by coincidence so there is nothing to "be bottled and passed on to others" besides maybe the assuming: "constructing heroes make good stories".

³⁵ Friendly Fire, pp. 105-7, 118, 135, 212

PRACTICAL

To give examples about what's said in the theoretical part there are three cases in the practical chapter. First both are focusing on airline industry where a worldwide substantial change has been seen in the last decade arising mainly from the liberalisation of air transport. One major ingredient is the emergence and dramatic growth of low-cost carriers another is the strengthening of global alliances which made the airline business increasingly competitive. These constraints made (and still makes) rigorous airline operations planning, based on thorough travel demand analysis, yield management and schedule optimisation techniques, necessary what have or (based on the theory before) must have a tremendous impact onto the organizational cultures.

The first case pictures an accident with a lot of “mysterious markers” but was investigated without asking any questions about the culture in which the problematic outcome was embedded. The second shows generally the questionable tools to increase production which can draw conclusions for the first. For the third the practical field is changed while the content is not. NASA'S shuttle losses were baked in a highly constrained atmosphere. But they occurred in a surrounding of higher public agenda so the investigations and writings about the disaster are incomparably more and so much more differentiated. What is, from the perspective of this work, seen as a change to practically picture all the considerations that were made before.¹

HAPAG-LLOYD Accident (2000)

Case



Fig. 1: Airbus A 310 after the crash landing in Vienna/Schwechat

Photo: DPA

July 12, 2000 / Hapag Loyd Flight HF 3378 / Airbus A 310 with 143 passengers and 8 crew / scheduled flight from Chania (Greece) to Hannover (Germany) / basic problem – a not retractable gear / enhanced fuel consumption in cruise because of higher drag / [...] / double flame out on the final approach into Vienna Schwechat / Emergency (Crash) Landing 600 m in front of runway 34 / substantial damage of the Aircraft / “only” 26 passengers with minor injuries caused by the evacuation over the slides;

¹ With that is *not* meant that safety in civil aviation is not of public interest – it highly is – what had the effect that the whole field in the last 30 years in opposite to e.g. medicine got very transparent and so safe but space flight are for sure more special. This shows generally how difficult and complex it is to investigate accidents with taking the social dimensions into account.

Investigation

According to the Investigation Report of the Austrian Board for Traffic the Captain was flying the Aircraft “dry” – means till the tanks were empty. On the first sight: “unbelievable, incredible” – how could he have done that? He was well trained and checked (all licenses were valid), well experienced (12 years in the role of Captain, 23400 hours at all, 8400 on the A310, all (redundant) systems like fuel displays and warnings were working well, the only threat (the only thing that was not working) was a not retractable gear – that’s basic knowledge that a higher drag enhance the fuel consumption, even the Co-pilot said on the court trail that “I have pushed the Captain several times (without success) to land first in Zagreb and than in Graz”²

Not to ones surprise the court ended with a condemnation because of “dangerous interference into air-traffic” (sentenced to six months imprisonment placed on probation), the loss of the license and the sending of the, at the time, 56 year old into early retirement.³ The Investigation came to the conclusion: “Violation of company regulations according fuel reserve, caused by several Human Factors – mainly workload and stress”⁴ It’s indeed an interesting case – especially that both Pilots reported at court that they didn’t have known that the FMS is not able to consider a not retractable gear and they were at every training told to trust (at any rate) the Computer.⁵

But even more interesting is the factor that nobody asked: Why was this Captain so home base oriented? What was the driver that he wanted first to Munich and then to Vienna? Is there a possible influence of the company culture? Could the incident be seen as his trail to reach “by hook or by crook” maintenance and connecting flights for the passengers? Was he trying to be a “good” employee by making the impossible, possible? This would be then a convincing example for the “Motivation Trap” where on a certain point (pushed through sub-conscious drivers) motivation gets counterproductive but also for the paradox that’s inherent in a “high reliability” approach.

There are some markers in the Report. The captain was known in the company as: “highly motivated” and decreed with: “excellent basic flight skills and a failure-free career – no risky behaviour could have been detected till the accident – his decision-making was always based on solid considerations”.⁶ So isn’t it a little bit to “cheap” to only assume that on this day the “harzardian” side of his personality came into light? Interesting is also that after the accident he phoned immediately – instead of being involved with the evacuation – the Hapag Lloyd Head Office.⁷ Doesn’t that says something about the Loyalty towards “his” company? All those are indeed some signs that the “dark side of will” and the “dark side of discipline” played a role in his decision making. As usual the investigation didn’t ask the involved captain, the company and also not themselves those questions. The whole Investigation Report didn’t bring up (on its 50 pages) one question about the company culture – so finally everything said above stays speculation.

² Agence France-Press, May 4, 2004

³ Ibid

⁴ Investigation Report, Austrian Board for Traffic, 2006, p.47

⁵ Agence France-Press, ibid

⁶ Investigation Report, ibid, p.13

⁷ Ibid, p.18

Erosion of *the* Safety-First Policy

As another input for the first case and to understand which paths production pressures can take it's pretty interesting to focus on general incentive schemata used in aviation today. One that's very popular for Air-Carrier is to print as an eye-catcher the ranking of on-time arrivals on the front pages of their in-flight magazines. Interestingly the one who are presenting the numbers are nearly 100 % the top performers¹. This should probably show their virility in front of costumers. Additionally there are articles placed which underlines this "we do everything in the interest of our flight guests" engagement.² What's really tough then, is, when the Chief Operating Officer which role is also defined to hold protective duties and responsibilities emphasizing this one-way sight. But this happens. So is e.g. Sky-Europe's Jason Bitter in an interview explicitly saying that punctuality is his highest priority: "It is easy to make excuses and blame air traffic controllers or the weather, but the reality is that we are always looking for solutions and not excuses..."

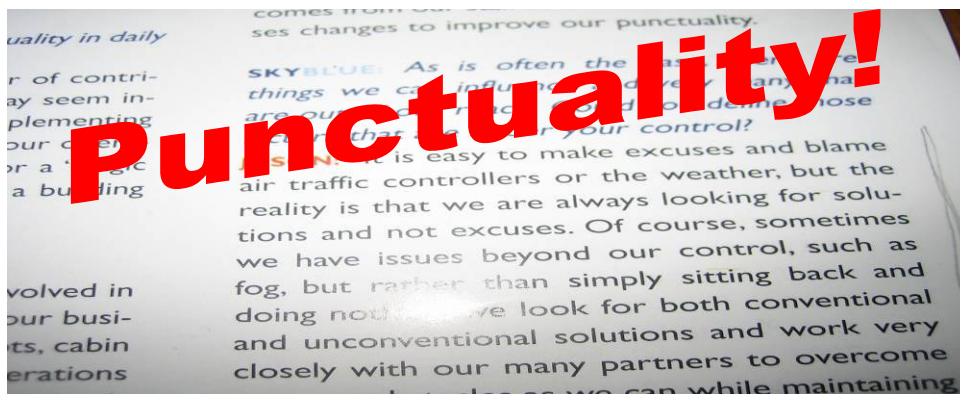


Fig. 2: Sky Blue/In-flight Magazine, p. 8

Photo: Author

The pertinent question is: Who are the "good" captains for a management then? The ones who are "producing" a Go-around due to safety reasons or the ones landing un-stabilized but on schedule? This is not only a goal conflict this induces a group dynamic – a competition (on safety related issues) between the employees by who is the best in the in-house on-time ranking. What breaks up positive Loyalty in-between the pilots and enforces a "Culture of Production". The premises in this culture are the food for the unconscious mind which strongly drives the pilots to take higher risk.

The pressure on Sky-Europe even increased since the time this interview was given. Maybe its coincidence but exactly Jason Bitter upgraded last year to the highest rank at Sky-Europe Airlines and holds now the position of the CEO. If there is coherence or not is indeterminable but it's at least interesting that those personality markers, Bitter, via this interview shows are pictured on one hand as highly useful to make whatever career but also as highly problematic under the point "(Super) Father-figures" in this writing (see pp. 15-17) To be fair it must be added, that statistically there is no conspicuity that so called low-cost carrier are unsafer than major airlines. But to speak with Woods "Creating Foresight"...and finally interesting – Spanair provides a punctuality guarantee²

¹ e.g. Ryanair No. 1 on-time major airline in Europe, Ryanair Magazin, p.3

² This also shows something about society's unleashed wants to get everything at every time. And what's paradox - although so many people are suffering from fear of flying it's generally not realized that punctuality at any rate is not only not a desirable goal but could be easily a major threat on flight safety.

³ Star-Alliance Homepage, retrieved Sept. 17, 2008 from <http://www.staralliance.com/en/meta/airlines/JK.html>

NASA's Shuttle Losses

Realizing that the public and political interest after the Apollo Flights inflated, NASA was afraid that the whole project “Space Shuttle” by facing the costs could be endangered from the beginning. As a result NASA’s representatives “promised” that the Shuttle Programme will follow NASA’s legendary “can do” attitude but on an approach of being commercial successful.¹ This was the birth of a myth, which developed two times into a Killer-Myth.

Challenger

The Sociologist Diane Vaughan (1996) states: “Top NASA administrators were *absorbed* with “myth managing””² (emphasis added). Practically the myth, of being operational (like a bus shuttle) as precondition for the commercial success, was managed with underneath the two major ingredients for the illusion of control and the motivation trap. First: If the *will* is there we can make the impossible, possible. Second: A strong leader and a steep hierarchy should be of help.

Vaughan writes about the boss’ Bill Lucas leading style (and is so bolstering the considerations of the Control Value-Square): “Lucas inspired culture sounds very like the “culture of reliability” that HRT theorists call for to assume uniform responses and predictability in time of crises. Military discipline, clear authority structure, formalization, and rigor were its hallmarks. We might even conclude that prior to the tragedy, this culture was working well: problems were discovered, launches were delayed while fixes were implemented, and disasters were averted.”³



Fig. 3: Challenger Accident, Crew

Photos: NASA

¹ The shuttles should compete e.g. with the unmanned Ariane Rocket Programme by launching satellites. But it is already eye-catching problematic to even think about a (commercial) competition between manned and unmanned spaceflights. Beside the potentiality to launch satellites with manned rockets there is absolutely no need to do so (the exceptions was or are some “none standard” missions). Manned and unmanned space-flights are two different concepts. The first is (basically) following a “human dream” (explore and expand the “normal” life environment), latter is (basically) a commercial tool. On this background the whole Space Shuttle Programme was or is pretty successful. It had flown from April 1981 to October 2007 120 Missions – 2 failed. That makes statistically a success-rate of 98.33 %. Ariane (all evolution types 1-5) flew from December 1979 to November 2007 179 times into space with an average success-rate of (only) 88.41 % (source Wikipedia). That is indeed a great discrepancy but the biggest difference, creating “the problem”, is that there are humans sitting in the shuttle. It’s known that for the improvement of the last 1.67% safety a tremendous amount of effort is needed (progressive curve). And for this (last) effort there was at *no* time (through the whole Shuttle program) the recourses existing – in contrast to the Apollo program with its unlimited budget – and no loss.

² The Challenger Launch Decision, 1996, p. 212

³ Ibid p. 418

One of the most important chapters in Vaughan's book – "The Culture of Production" starts with: "The chilling question is, Why did worried engineers repeatedly recommend launching in the face of continued and worsening signals of potential danger?"⁴ Nancy Leveson (2007) is asking about the circumstance that it was generally known and discussed that the erosion of the O-rings of the Solid Rocket Boosters (SRB) are a potential threat: "Why would intelligent, highly educated, and highly motivated engineers engage in such poor decision-making processes and act in a way that seems irrational in retrospect?"⁵ Vaughan's answer is citing Chester Barnard: "Management sets the premises of decisions in organisations" with adding "So powerful are widely shared cultural beliefs and taken-for-granted categories and procedures that they need not be formally expressed"⁶ Leveson comes to the conclusion that: "This type of culture can be described as a *culture of denial* – Managers [...] listened to those who told them what they wanted to hear" (emphasis in original).⁷

So both authors' pictures exactly what the constitution and running of a Steep Hierarchy is about. There was at no time a continuous "Adult to Adult" level of encounter. Engineers were not taken serious (enough) and they were afraid. The facts remarked by Solid Rocket Motor (SRM) Program Manager Larry Wear: "The last thing in the world you want to have happen to you is to stand up and say Dr. Lucas we forgot to..." and SRB Project Manager Larry Mulloy: "Don't make me go tell Bill Lucas that we haven't completed [...] that is now holding up launch" tells books about the structure at NASA at this time. Even high rank people were afraid to get into a confrontation with the boss. Typically is also what Mulloy, about the group dynamic this culture caused in the whole SRB team, trying hard to fulfil the requirements, states: "We were (towards ourselves) absolutely relentless [...] stuff got done over night". And he remembers that as something positive: "that was the beauty [...] it just kept things moving along nicely".⁸

This positive connotation is also pictured in McDonald's et al. (2002) statements about the internalization of external pressure. Production pressure is no longer seen as an organizational problem its handed over to high motivated individuals. McDonald sees the major drivers for this process lying in Sub-ordinates professional pride. But seeing it out of a depth-psychological perspective this pride is coming mainly from followers' collective Child Ego States. Those Child feelings makes them to such "good workers" being over-loyal, working day and night to fulfil the wishes of the Superior with an internalization of – this man (exactly) knows what he is doing and we are enhanced in our status to be part of his "Team".

Behaviour out of a followers' collective Adult Ego State would not only have putted "effort" into Production. Adult pride is not only sourced by Loyalty but also by enmity. It's to be afraid which causes a learning process to avoid enmity (to don't wake the sleeping dog). This makes automatically happen to do what the boss wants without asking questions (also not to one-self) or to only ask questions the boss wants to hear. This is not only to not get into confrontation with him but also to avoid the confrontation with the "own" followers group. So anyway if as main emotional source fear and/or pride are detected, both are determined through typically Child to Parent transferences. The (Super) Father-figure Lucas is causing with his behaviour Child responses in the group of sub-ordinates. Brave children are fighting against missing resources and competing with each other to get seen and acknowledged. (Look daddy what I have done for you – I am the best, aren't I?)

⁴ Ibid, p.196

⁵ Technical and Managerial Factors in the NASA Challenger and Columbia Losses, p.9

⁶ Vaughan, ibid, p.197

⁷ Leveson, ibid, p.8

⁸ Vaughan, ibid, pp. 220-221

Additionally Lucas over-bureaucratic style (Vaughan quotes it as “Bureau-pathological”)⁹ helped to intensify his power position. To make law out of own ideas is indeed very powerful. This can be categorized as an everlasting trail to get limitless control over the entire organisation which is justified by books then. Larry Wear: “Whatever people remember about Bill Lucas, one thing he would not tolerate was that you attempted to slip something by him without full disclosure. That was death...”¹⁰ On the other hand was Lucas known as highly intimidating when people presented stuff. Larry Wear: “The Center Board would be held in [...] an auditorium. There might be [...] one hundred and fifty people [...] I heard him (Lucas) say several times (towards the presenter in front of the whole auditorium) I just don’t believe this represents the standards of this Center, do you? Of course (the one presented) would say, No, sir, I certainly don’t” And about the auditorium, Wear states: “Ninety percent of whom weren’t going to ask [...] any questions...Its great drama ” and “I think there are some people who have, what’s the word, there’s a word for when you enjoy somebody else’s punishment...masochistic, they are masochistic.”¹¹ By the way that’s sadistic but the whole scenery let one be definitely reminded on some law and order “cultures” of totalitarian leaders.¹²

The psychological markers pictured in the remarks above shows Lucas as a person who has very little trust towards others and a high will to not let others come into power positions by making people small – giving them basically the impression they are (and never will be) good enough. Those are all unmistakable signs for the described anti-social personality- and leadership-style. The Sub-ordinates tries to stay out of the “field of shooting” by generally don’t ask questions or in minimum to not behave loyal towards those who are in the sight of the chief. And it gets even adverse on a social level – there is lust then to be spectator of this public inquisition identifying with the persecutor. It’s pretty impossible in such an atmosphere as a Sub-ordinate to act non-conforms without getting selected out immediately – the *dark side of discipline* is demanded and so (real) whistle blowing practically out of range.

The crucial point to focus, is, that this whole behaviour and the inherent group-dynamic was made in the name of high reliability. It’s so a compelling example about the impossibility and counter productivity to “produce” safety as a rigid act of will. It’s so to say an irony of fate that the “control-freak” Lucas who was so winning oriented ran (as the head and causer for such steep hierarchy) at last a risk which leads to the loss off crew and mission. Psychologically seen he became a victim of his own will (*the dark side of will*). His strong desire for (public) image pushed him to launch, which lead to the worst of all (public) images. Vaughan quotes the launch decision as Counterintuitive¹³ – **which** is a very interesting expression because intuition, as the round integrative (matriarchic) and so protective source was indeed pretty missing.

⁹ Ibid, p. 210

¹⁰ Ibid, p. 221

¹¹ Ibid, pp. 219-220

¹² In opposite to Vaughan (see p. 8) this work sees very well learning potential in books like Hannah Arendt’s (1963) “Eichmann in Jerusalem: A Report on the Banality of Evil”. There is no deeper chance to speak about Totalitarianism than focusing on the structure and power of the Nazi regime. That looks on the first sight as “going too far” and for sure it can raise (additional) resistance (what have NASA and Hitler Germany to do with each other!?) but it is a “good” example because it shows lastingly how far a sub-conscious Conformism process can go and how people with a problematic psychological background are from the system selected and putted into positions to make these disasters happen. In the end it pictures the underlying structure of every (abusing) “power over” system and it’s inescapable to face these mechanisms if one wants to overcome them in the future. Totalitarianism (as the extreme extend of Steep Hierarchy) and Conformism need each other what is best demonstrated through the writing of the learned woman Arendt who cited Eichmann. He was justifying his doing in front of court with: I always acted according Kant’s Categorical imperative. There could not be a better (but also more frightening) example how Conformism works. The phrase means absolute the opposite than Eichmann was interpreting into.

¹³ Vaughan, *ibid*, p. 12

And – by focusing the whole picture it even gets visible that the catastrophic scenery was baked into the system from the beginning. It was only a question of time when the pressure in the inside of NASA sourced by the pressure from outside would push the whole entire system over the edge. While years went by the original promises to be operational and commercially successful got more and more claimed – from politics and society with the helping hand from media. People had no acceptance for delays and “waste of tax” anymore. So there was a daily rising production pressure while the organization was falling more and more behind schedule. People (and here especially middle management) were already acting over their capacity but more (much more) was demanded – a circle one can not escape – the only change would have been to disenchant the myth.

On this fatally January morning there were additionally three factors. First a pretty usual constraint: The launch was delayed. Due to launching problems and postponing the Columbia start before (the NASA sets with seven false starts its own record) and other factors this was already the fifth date. Second a very seldom threat for the shuttle: The temperature was -10° (Celsius) on this day in Cape Canaveral (Florida) – a very rare weather situation which has (and that was also known) an additionally (not tested before) impact onto the already problematic sealing of the O-ring in the SRB's. Third a very special constraint for the whole organization: This flight was part of the “Teacher in Space Program”. Christa McAuliffe – a teacher and „average citizen” participated as crew member which should be also a major statement about the reliability of space travel. Moreover, there are signs that President Reagan (who by the way cut the budget for education before and had a special interest for positive press in this field) had for this eve a live transmission to the shuttle and Christa McAuliffe planned on prime-time television while his Presidents State of the Union message. This for sure would have pressed Challenger to be up in time for the speech. The rest is known – 59 seconds after lift off the seal off the SRB failed – some other seconds later the vehicle exploded.

Vaughan reports that there was: “post-tragedy speculation [...] that a White House official gave orders for Challenger to lift off” but the Presidential Commission who investigated the accident: “finding no evidence that confirmed the allegation that the White House intervened.”¹⁴ So beside, that it's not really surprising that the ones who investigate can (unfortunately) find no evidence of their own involvement the question was (and still) is: Whose fault was it? Following the considerations above, the answer sounds obvious – it's Bill Lucas'. But the intention of this work is *not* finding culprits or alternative culprits to the ones found before. It's about understanding the system that made this disaster happen.

So it's necessary to see that also Lucas got a victim of a culture he – paradox – strongly helped to install before. This is not said to foil what's said above – Lucas leadership style was, seen from a social perspective, definitely counterproductive but he was on the other hand just the right person to run the myth everyone (society, politics, media) adored. He showed conformism¹⁵ towards those “up” by not having the charisma to formulate a *no* and act so as a defensive layer for the organization and acted overconfident and controlling towards those “down” and hinders so Sub-ordinates to act as defensive layers. That's indeed big drama.

¹⁴ Ibid, p. 13

¹⁵ Additionally, to picture how complex Loyalty conflicts and conformist drivers can be and which wide range and impact they can have an aspect is in this context of high interest that Nancy Leveson brought in her speech in June 2008 at Lund University into discussion. Leveson said that a mayor impact for the design of the SRB's, causing those sealing problems, was that they have to be built in four segments. This was (also) necessary because they were produced at Thiokol in Utah and has to be shipped across the US to be assembled at Kennedy's Space Center (Florida). Interesting for this (questionable) process is that Thiokol is run by Mormons and Bill Lucas, who is also a Mormon showed from the beginning a high interest in this (suboptimal) solution.

But the accident cannot be made to his “fault”. There is no doubt that it was also Lucas intention to let crew and shuttle return home safely. He tried to do his best to avoid disaster. He believed in his way of encounter, thinking that his “controlling system” would be good for safety. So it’s *not* a question of morale. He tried to be a good (strict) father (with the self-picture of carrying the load of further existence of the shuttle project and so 8000 jobs, even the whole prestige of the national “Icon” NASA on his shoulders). So it needs much more than finding or constructing a (or another) scape-goat that could be sacrificed in front of collective helplessness caused by such disasters. A “New View” on human error strongly argues for overcoming blame and the installation of a systemic (holistic) approach of understanding and learning as a counterweight to the (well-known) dualism of good and evil – which is not the de-installation of accountability but the reframe of accountability. It’s a plea for accountability out of synergetic hierarchies.

Synergetic hierarchies bundling of positive collective resources would have found out from the beginning (or in minimum after the first problems) the impossibility to fulfil society’s (and owns) desires for a low cost “star bus”. As result the collective would have had the courage to confront – first themselves and then politics and media with this reality. But they also (or because of that) would have had the power then (to not give up but) to stay creative and find and present some viable alternative approaches fitting to the resources. The myth would have been collapsed and new paths would have been opened. This is exactly what the words “balancing Loyalty and Resilience” are meaning and what the whole Control Value-Square is about. For sure – what’s said is sourced by hindsight – its always easier to look back then to look forwards but speaking about Resilience Engineering – learning from failures and creating foresight it’s from the perspective of this convolute the only way how reflective (highly conscious) systems can work.

What happened with learning from Challenger? Not what’s said in the last paragraph! Nonetheless the Presidential Commission pointed on a basically faulty design of the SRB’s, problems with organizational oversight – even on a silent safety program and production pressures, the whole picture, the culture in which the accident happened stayed pretty untouched. Finally, following the post-tragedy New York Times front page header: “NASA had Warning of a Disaster Risk Posed by Booster”¹⁶, middle managements flawed decision making was pretty much detected as cause. Although legal system was not involved what stayed was that middle management was found guilty. According the Presidential Commission report they played: “a kind of Russian roulette”¹⁷ by not taking the known O-ring erosion serious enough and failed to report up the hierarchy adequately: “Those who made that (launch) decision were unaware of the recent history of problems concerning the O-rings [...] If the decision makers had known all of the facts, it is highly unlikely that they would have decided to launch 51-L (Challenger) on January 28, 1986”¹⁸. It’s irony that at the end “more of the same” is demanded – the conclusion is that not enough control happened. This finally shows about the difficulties to overcome the Illusion of Control but also the ease to hand over blame to some “unmoral” engineers.¹⁹ So the “myth” stayed alive at NASA – a second lesson was needed.

¹⁶ Vaughan, *ibid*, p. 11

¹⁷ The Presidential Commission on the Challenger Accident Report, chapter 6: An Accident rooted in History

¹⁸ *Ibid*, chapter 5: The contributing cause of the accident

¹⁹ It’s a right, especially of those who lost family or close friends, to ask for ones being responsible for the disaster. But to present middle management as scape-goats is real brashness. Nancy Leveson shared in June 2008 about engineers commitment at NASA in the 1980’s that people where giving up their social lives, even their families to follow “their dream” (see also p. 17 top). Vaughan states: “Middle Managers are most likely to be held accountable because they made the decisions [...] and left “twisted in the wind”, while more powerful administrators – some outside the NASA organization, who had acted years earlier in ways that influenced the outcome – are not [...] people at both the top and the bottom of the hierarchy escape”, p. 409

Columbia

Woods (2003) states that “the Columbia Accident Investigation Board (CAIB) found the hole in the wing was not simply produced by debris, but by holes in organizational decision making” and that again “NASA failed to balance safety risks with intense production pressure”²⁰ After the shock from Challenger and some post-tragedy improvements based on the recommendations of the Presidential Commission it came again to an erosion of the Safety Culture (a drift into failure) what lead 17 years after Challenger into the second tragic Shuttle accident.



Fig. 4: Columbia Crew, Accident

Photos: NASA, CNN

Short after Columbia’s lift off a large piece of hand-crafted insulating foam came off an area where the Orbiter attaches to the External Tank and struck the leading edge of Columbia’s left wing. This event was not detected by the crew on board or seen by ground support teams until the next day, during detailed reviews of all launch camera photography and videos. This foam strike had no apparent effect on the daily conduct of the 16-day mission, which met all its objectives. But the foam strike event caused a breach in the left wing what was of sufficient size to allow superheated air to penetrate the shuttle while re-entering Earth’s atmosphere at the end of the mission. Once in the interior, the superheated air began to destroy the left wing, the controls over the vehicle got lost and finally the whole mission and crew – Columbia broke into pieces on February 1, 2003.

Daniel Goldin, the longest-serving NASA Administrator (1992-2001) can be specified as the main producer of the company culture the years before the Columbia accident. Nonetheless the self-proclaimed “agent of change”²³ brought positive progress into NASA, like integrating Russia into the Space Station partnership 1993²¹, and even declared a space launch crisis in June 1999 where he asked for additional resources to the NASA budget for safety upgrades, he was just the right person to keep up the “myth”. Goldin got not only confronted with the impossibility to get additional money from public authorities but even with the reality that budgets decreased and that additional interests from outside were claimed.²⁴ In combination with the very little choices of managers to reduce costs it gets understandable that the self-picture of the head, being an “agent of change”, easily developed to an irresolvable inner and so outer problem.

²⁰ Creating Foresight: How Resilience Engineering can transform NASA’s Approach to Risky Decision Making, p. 1

²¹ Report of the Columbia Accident Investigation Board, 2003, p.106

²² Ibid, p. 118

²³ Ibid, p. 105

²⁴ e.g. the Clinton Administration forced that \$650 million of NASA’s human space flight budget was used to purchase Russian hardware to support the administration of Boris Jelzin, Ibid, p. 104

Goldin got more and more a victim of his “famous” faster, better *and* cheaper approach. He tried hard to make the impossible, possible while at the end of his engagement in 2001 an experienced observer of the shuttle program Harold Gehman described the shuttle workforce as: “The Few, the Tired”²⁵ Also Goldin’s behaviour can be seen as driven by the *dark side of will* and so as an very problematic leadership style. In opposite to Lucas, who was pretty obsessive – trying to control everything and everyone, it looks like that he felt and thought, and gave so everyone else around the impression, that there is nothing to worry about anyway. According the CAIB Goldin described himself as: “sharp-edged” and could often be blunt. He rejected the criticism that he was sacrificing safety in the name of efficiency. In 1994 he told an audience at the Jet Propulsion Laboratory, “When I ask for the budget to be cut, I’m told it’s going to impact safety on the Space Shuttle [...] I think that’s a bunch of crap.”²⁶

This can be named as a kind of “strong hierarchic looks like lazier fair leadership style”. Such style is determined through this omnipotent self-picture and an unleashed “Think positive myth”. To keep both up it is necessary, citing Leveson’s *Culture of denial* again, that: “Managers created barriers against dissenting opinions”.²⁷ So it looks not like an coincidence that in September 2001 (in the same year of Gehman’s concern) in a testimony on the Shuttle’s achievements the Deputy Associate Administrator for Space Flight, William Ready states: “The safety of the Space Shuttle has been dramatically improved by reducing risk by more than a factor of five.”²⁸ Leveson says about this statement: “It is difficult to imagine where this number came from as safety upgrades and improvements had been deferred while, at the same time, the infrastructure continued to erode”²⁹ This is (from hindsight) a convincing example for the *dark side of discipline* – about how Sub-ordinates constructs realities in a way to fulfil Superiors world pictures.

As base or as distillation or as result for this “faster, better *and* cheaper approach” must be seen the so called 1995 Kraft Report. The charter: “the NASA Administrator (Goldin) asked Dr. Christopher Kraft to form a team of individuals external to the agency [...] to recommend alternative operational concepts that could significantly reduce operating costs.”³⁰ This approach is not surprising. For sure it must be allowed for a chief to think about possibilities to reduce costs but it shows first: That its generally rarely that the ones chosen for such jobs not find what the payer wants to be found and second: That those outsourced findings are exactly following the bigger cultural wants and needs. Both have something to do with being over-loyal and so with Conformism and its sub-conscious drivers. In this case the Kraft Report attested that so wanted: “The Shuttle is Operational”.³¹

The next step in the report is logical – with the achievement of being operational the report sees that: “The Challenger incident created a safety environment that is duplicative and expensive [...] cost in excess of \$350 million. The “safety shield” [...] created a difficult management situation. Managers, engineers, and business people are reluctant to make decisions that involve risk because of the fear of persecution. Safety is one of those terms that can be used to hide behind and prevent necessary change and innovation.”³²

²⁵ Harold Gehman, Chair of Columbia Accident Investigation Board, cited after Nancy Leveson, Technical and Managerial Factors in the NASA Challenger and Columbia Losses, 2007, p.4

²⁶ CAIB, *ibid*, p.106

²⁷ Nancy Leveson, Technical and Managerial Factors in the NASA Challenger and Columbia Losses, p.8

²⁸ CAIB, *ibid*, p.101

²⁹ Leveson, *ibid*, p.9

³⁰ Report of the Space Shuttle Management Independent Review, Introduction, Christopher Kraft, February 1995

³¹ *Ibid*, executive summary, the exact wording is: “The team also determined that the shuttle has become a mature and reliable system”

³² Leveson, *ibid*, p.9

The “Safety Shield” is indeed, even it’s not from Goldin self, a very “sharp edged” formulation. It imputes a kind of conspiracy. The conclusion and recommendation of the Kraft Report is, in respect of the safety situation, according to its findings: “Restructure and reduce the overall Safety, Reliability and Quality Assurance elements” which is possible “without reducing safety.”³³ So the after the Challenger accident from the Presidential Commission as “silent” criticised safety program regained its strength, but got flawed again through the Kraft Report in 1995. One can assume that times for “Whistle-Blowers” got harder after this event. One of them – the engineer José Garcia sent a letter to President Bill Clinton where he stated: “The biggest threat to the safety of the crew since the Challenger disaster is presently underway at NASA.” Garcia’s particular concern was NASA’s: “efforts to delete the checks and balances system of processing Shuttles as a way of saving money”.

The CAIB connotes the giving up of this expensive but effective cross check technique as: “you can’t delete NASA’s checks and balances system [...] without affecting the safety of the Shuttle and crew.” And as interesting by-text CAIB is stating: “Anyone who doesn’t have a hidden agenda or fear of losing his job would admit that”³⁴ One who putted his job on stake to “protest” against the cost saving plans of Goldin’s management was the head of the Space Shuttle Program at NASA Headquarters Bryan O’Connor. O’Connor saw another threat coming up at this time. He argued that the transfer of the management function to the Johnson Space Center would return the Shuttle Program management to the flawed structure that was in place before the Challenger accident. “It is a safety issue,” he said, “we ran it that way (with program management at Headquarters, as recommended by the Presidential Commission) for 10 years without a mishap and I didn’t see any reason why we should go back to the way we operated in the pre-Challenger days.” Goldin gave O’Connor several opportunities to present his arguments against a transfer of management responsibility, but ultimately decided to proceed. O’Connor felt he had no choice but to resign.³⁵

For sure it is not admissible to construct (from the hindsight) a mono-causality between resigning of (unsatisfied) employees and accidents. There are or can be also other factors like e.g. rivalry. But it’s basically a strong (negative) sign if the ones putting (loud) criticism giving up and getting replaced by more conform ones. The system looses reflective forces and a recovery (from whatever problem) from inside gets even more difficult then. Finally the chance for (whatever) structural erosion is increasing. And the structural erosions happened again at NASA at this time. The foam losses were, as the O-rings, a known problem but didn’t get detected as threats but as acceptable risks. According a Herald tribune article as the birth of the accidental chain for Columbia the erosion of the Safety Culture at Lockheed Martin could be seen, which as a contractor applied the insulating foam to the external fuel tanks.

In the interview a former employee reported that: “shortcuts were occasionally taken [...] to meet production deadlines or to please upper management”. While all of the workers (current *and* former ones) stated that “the work was generally of high caliber” and this could have been not the root cause to the accident, they also agreed that “there were practices that weakened quality control” So e.g. a program had been watered down that paid Sub-ordinates a fee for finding defects: “probably because of budget squeezes” workers said. A Lockheed spokesman cited in the article said (not to ones surprise): “workers and inspectors took their work seriously.”³⁶

³³ Kraft, *ibid*

³⁴ CAIB, *ibid*, p.108

³⁴ *Ibid*, p.108

³⁵ *Ibid*, p.107

³⁶ International Herald Tribune, February 19, 2003

Again – it’s not about finding scape goats. It’s about understanding the whole picture – and interviews like this gives a taste what impact NASA’s production pressure onto Lockheed managements had and how those in turn handed it over rank-down till it catches on the ones brushing the foam onto the tanks. So it’s probably right what Lockheed spokesman stated and additionally to take into account that all people who give such post-tragedy interviews, especially those still working in the plant, come immediately in a Loyalty-conflict. But what’s even more important is to focus on organizations and so employee’s pre-tragedy reality. Such constraints frustrate and stress all involved persons. A permanent state of emergency induce the feeling how hard ever ones try – it will be never enough, there is always this “being behind and so not-ok feeling” with additionally a not decreasing but increasing tendency. This and giving up positive incentive systems, where workers gets the impression that their work is not seen as so important anymore, are negative strokes and erodes the structure. The devils circle begins. People who feel not ok are not of help to create good and stable working atmospheres. Disputes and so fluctuation of (the more sensible) employees are programmed what in turn increase the problem.

All these processes happens mostly sub-conscious or in maximum semi-conscious (following the “cleverness of the psyche”– see p. 13). Reflexive resources which are necessary to detect threats are overlaid by inner- and interpersonal struggles then. Protection and accountability building impulses for the whole issue would have had only come into individual’s conscious mind if there would have been space for it – means if those contents would have had a chance in the outside world to succeed. So it makes no sense (for what flawed decision-making on which level ever) to complain about: “self deception, introversion and a diminished curiosity” like the CAIB is doing it. Beside many innovative sights this is a typical hindsight perspective to interpret “complacency” into the drama stating that people haven’t had the will to see “the world outside the perfect place (NASA).”³⁷ This was not a question of will – the whole organization drifted (again), by constituting a Steep hierarchy and a culture of Conformism, into a situation were it had no choices, no resources, and no space to detect that it was, to speak with Woods words: “operating nearer to safety boundaries than it realizes”. NASA lead by a “will driven” management (*dark side of will*) got another lesson for collectively following (*dark side of discipline*) the unmanageable “myth”.

After this second disaster in practice a shift to *Acceptance* happened. It looks like that reality created a general accordance that being operational and commercially successful is (at this point) an illusion for manned Space Flights. So e.g. NASA nowadays brings, because of redundancy reasons, another shuttle into launch position after one started. But the paradox is that this doesn’t necessarily mean that the “myth” is detected because this accordance is not explicitly expressed. Psychological seen is only what’s explicitly expressed *really* accepted. So the chance to learn – to see and accept the bigger picture about this humanly catastrophe but also about the counter productivity of losing such unimaginable amount of money because of the will to save money, is there. What standing against is that there are so many psychological, sociological and especially political questions linked with cases like this that really talking about backgrounds would bring “automatically” discussions up about the need of general paradigm shifts in politics and society. If nothing gets learned – if this is only another phase of post-tragedy shock and there isn’t an sustainable approach of Resilience Engineering establishing the “myth” will be awaken again – someone who is taking “him” up promising a faster, better *and* cheaper approach and lead NASA to the next disaster is for sure found easily.

³⁷ CAIB, *ibid*, p.118

CONCLUSIONS

One of the recurrent themes in this work is relationship. Relationships in organizations are – if one likes it or not – a reality. Even if they are not focused and if there is not paid attention onto (or because of that) they constitute the atmosphere and the conditions under which people work. Both have, as the thesis lastingly shows, a predominant impact on organizations outcome. To understand these relationships it needs a basic understanding about human beings – about how feelings, thoughts and beliefs are generated and how these individual humans' features interact with those from others. Knowledge based on depth-psychology can be of great help to understand these socio-technical and organizational interactions in general and in special to reflect about mishaps.

There it's not necessary that everyone in a company mutates to a psychological specialist – it is not about naming all these sub-conscious phenomena's – such basic things as e.g. to accept the existence of the “myth of rationality” would already bring organizations a big step further. This would open spaces to reflect from other angles and it would generate common sense about the circumstance, that to invest in strong and integrative Safety Departments, who are the ones then to carry this psychological knowledge, is good investment in the future. Safety Departments endowed with enough sources are able to avoid one of the biggest social threats on organizations – Conformism – with the inherent inbreeding, routine-blindness and pseudo-reflection that such Pseudo-Teams have. Safety Departments helps to built up and keep Real Teams running which are determined through basically positive Loyalty but the right amounts of reflective enmity where the leaders aren't, due to their personal dramas, abuse their position but positively fill their role.

There is enough convincing evidence about what happens when the efforts on Safety get underpriced or the need for a holistic approach is ignored. Even on a very fundamental level concerning all humans the threats are manifest in these days – the losses and the endangerment or liquidation of whole entire bank-groups caused by hair-raising risk taking brought the world in a veritable economy crisis. With flawed supervision from outside and with only on mathematical models based inner risk management, denying human factors, the investment branch pushed the collective towards collapse. Fearing the worst, efforts with the inset of unbelievable buzzes started now which is indeed an master example about being re-active after following an illusion of control and got trapped by motivation. All disaster settled in the name of Production, resilient Protection was pretty absent. This shows that the considerations on Human Factors and System Safety are much more than a tool for (up to now) declared High Risk Environments.

It looks as a general need to learn about Acceptance for limits and to focus on sustainable Action. It gets more and more visible that we as society are on a point where we should open categorical discussions about which direction we think the world should go. This is on both – ideological and practical levels from interest. It looks like that our everlasting hunger for more pictured through the technical and organisational development with its increasing speed and complexity is not only not of help but endangers the entire systems. So this thesis is also a tool to understand and picture the interaction between technical and human (psychological, social, and political) motions and developments. It's basically taking the perspective of Humanistic Psychology which postulates: the next necessary and useful step for society's development is not so much lying in the outside but in the inside. It makes more sense to put (more) effort in the understanding of the already done technical steps then to only invest in newer, better, faster, more sophisticated technical innovation because one thing is from a psychological perspective for sure. Outer innovations cannot compensate inner imbalances or even heal personal dramas.

So the thesis could be also seen as the trail to find answers and explanations about maybe one of the biggest threats today – the collective belief systems about the necessity of a speed-full and unleashed liberalisation of the market which causes unmanageable amounts of mergers without any time of adaptation. Probably we should stop the trail to adapt but to detect this mania which causes unleashed and so unproductive enmity with a collective breakdown of trust and so relationships. It looks like we are facing Freud's thanatomania where everything we collectively built up – structure but also sense is (again) endangered to get destroyed. So in its core this is what the thesis is about – a passionate plea for sociality and working relationships and for an approach which Sigmund Freud made to his life-task – to detect individual and collective sub-conscious drivers and makes them conscious in the interest of the whole social systems. For our basic defensive mechanisms would that mean to be “sublimated” into mature defenses which are e.g. anticipation, altruism and humor.

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