[SPEAKER_01]
Welcome to this podcast about building a world-class risk and safety science university center.
Lessons from 45 years in Stavanger.
An interview with professor Terje Aven.
My name is Marja Ylönen and I'm working as associate professor in risk management and societal safety at the University of Stavanger.
University of Stavanger can be seen as a success story for risk and safety education and research.
Main focus of this podcast is on the education part.
Professor Terje Aven has played a key role in this development.
Can you summarize some key figures, Terje?
What is the current status of education?

[SPEAKER_00]
Yes, thank you, Marja.
We have programs on safety and risk on all levels, bachelor, master and PhD.
And I can mention that on the master level, we have two main programs, one on risk, covering all topics of risk, risk assessment, perception, communication, management and governance, and one other program on societal safety, security.
And there are approximately, I think, 100 candidates per year, which I think is quite impressive.
In addition, we have an experience-based master in risk and safety management.
And when it comes to the PhD program, it's referred to as in risk management and societal safety.
And we have 25 professors in risk and safety.
They all have positions in risk and safety.
I think half of them are full professors, half are associate professors.
And we have considerable research in various topics of generic and applied risk and safety science.

[SPEAKER_01]
How has such a development been possible?
The environment is unique in a world context.
What are the lessons learned?
In this podcast, Professor Aven will reflect on this, using his experiences and insights from University of Stavanger as a basis.
Throughout the podcast, Terje will summarize some of his main points by stating some key lessons.
And how many lessons do you have, Terje?

[SPEAKER_00]
I have 10 altogether.

[SPEAKER_01]
When did you join University of Stavanger?

[SPEAKER_00]
That was in 1984.
Then the institution was not a university, but a university college.
We offered a limited number of master programs and we were not
authorized to award PhD certificates.

[SPEAKER_01]
But you offered a study program in safety topics.

[SPEAKER_00]
Yes, we offered a one-year program on safety for candidates having a
bachelor degree in engineering or similar.
A program established with support from Phillips Petroleum Company.
And this was in 1982 or 83.

[SPEAKER_01]
but there were no risk safety program then offered on master level.
Am I correct?

[SPEAKER_00]
Yeah, that's correct.
When I came to the university, the first I did was to establish a
course on risk and reliability for master students in engineering.
And I started to supervise master students on safety and risk topics
in the engineering program, mainly petroleum engineering.

[SPEAKER_01]
And after some years, you could offer also a program on safety risk
at the master level.

[SPEAKER_00]
Yes, that was in 1987.
And it came as a result of another industry initiative.
Now, Statoil, or Equinor, it's the name today, some enthusiastic
people from Statoil were keen on strengthening safety.
the risk and safety education, and they also had some funding.
Nice.
The result was that we developed a specialization on safety and risk
in the petroleum engineering program.
And the first students graduated in 1989.
I think it was about seven students.

[SPEAKER_01]
Wow.
How could you explain this strong industry support for risk and
safety?

[SPEAKER_00]
Well, I think it was a lot about societal concerns concerning the
safety in this industry following some major accidents.
We had the Bravo blowout on the Ekofisk field in 1977 and later the
Alexander Kjelland accident in March 1980 that killed 123 workers.
And there are currently not many university programs in safety and
risk.

[SPEAKER_01]
What are the general lessons learned from this strong industry link?

[SPEAKER_00]
Yeah, let me summarize this in the first lesson.
Lesson one, you need external alliances.

[SPEAKER_01]
Could you please elaborate and explain that a little bit further?

[SPEAKER_00]
Yes.
First, I do not think we would have been able to develop the safety
and risk programs without industry support.
Many in the academic environment were skeptical to the field.
What is a safety and risk program?
We do not need them.
The topics could better be incorporated in the other domain-related
programs such as structural and mechanical engineering.
Secondly, external alliances must be built.
This is also important for the students to have job opportunities
and coming with funding, the doors normally are easier to open.

[SPEAKER_01]
If I remember correctly, your institution and you also had very good
contacts with the industry already before the initiative from
Statoil.

[SPEAKER_00]
Yes, we had.
For example, I remember that we had many master's thesis with
external supervisors from the industry.
Later, we established an industry forum to further develop the
collaboration, university, industry.

[SPEAKER_01]
I have heard that at that time the government was not very much
supporting your plans for developments.

[SPEAKER_00]
Yes, that's correct.
The Norwegian government had a policy at that time of central type
of thinking that each institution should have a clear focus area.
And for Stavanger, it was oil and gas.
Our goal was to develop the engineering program to all relevant
fields, not linked to a special industry.
It should be in structural and mechanical engineering, safety and
risk.
But the government said, no, we should focus on oil and gas.

[SPEAKER_01]
So then you construct the master program in offshore technology.

[SPEAKER_00]
Yes, we had a lot of internal discussions about strategy.
And as a result, we constructed offshore technology.
It was a smart political construction to get governmental approval,
which covered all the fields we had of interest.
Structural mechanical engineering, environmental engineering, safety
and risk.
But it was under the umbrella of offshore engineering.
And we used our contacts in the Parliament, Storting, to get support
for this new program.
And in 1992, we started.

[SPEAKER_01]
And this leads to the second lesson.

[SPEAKER_00]
Yes, lesson two.
We need to be flexible and adapt to political realities.

[SPEAKER_01]
And lobbying is also important.

[SPEAKER_00]
Yes, we used all the contacts we had from different political
parties.

[SPEAKER_01]
Can you mention some subjects or courses in this offshore safety
programme?

[SPEAKER_00]
Yeah, there were some basic courses in probability and statistics.
Then we had some common subjects for all the students in offshore
field management, project management, operation and maintenance and
safety.
And then for the specialisation, we had a lot of subjects in
relation to reliability and risk analysis and technical safety.

[SPEAKER_01]
Could you also say some words about the master program in
samfunnssikkerhet, meaning societal safety or security, that was
approved in 1999, if I remember correctly?

[SPEAKER_00]
Yes.
Again, external initiatives, about 1995 we had some extreme weather
events at that time, and we got some initiatives then from the
leader of the Norwegian Directorate for Civil Protection and a
county governor.
There was some internal skepticism in relation to this program, an
internal debate about the program name, Samfunnssikkerhet, Societal
Safety, Security.
But the result was that we established this program in 1999, and it
also had a technical specialization, but it was mainly kind of

founded in social sciences.
And the focus area was safety management, emergency preparedness and
crisis management, community planning and safety, and risk and
vulnerability analysis.
And we got some new academic positions.

[SPEAKER_01]
It is the end of the 1990s and you have two master programs on
safety and risk, but partly in different faculties and departments
and with very different scope and focus, it seems.
Could you explain what was it that unified these programs?

[SPEAKER_00]
I would say that it was the focus on generic risk and safety science
knowledge.
We had to serve different applications, but the core of the programs
were safety and risk subjects and topics.
From the start, this was the idea to build programs in safety and
risk, highlighting generic knowledge applicable to all type of
applications.

[SPEAKER_01]
And why was this important?

[SPEAKER_00]
Because it would make the programs robust and easily adapted to new
types of applications meeting societal and industrial needs.
We were able to develop a program in societal safety and security
quite easily as we could build on a safety risk foundation.
And this was also, of course, important for why these external
organizations and people came to our institution.
It was known that we had high competence in safety and risk topics.

[SPEAKER_01]
When hiring new professors, you highlighted competence on safety and
risk more than the application areas like offshore or petroleum
engineering.

[SPEAKER_00]
Yes, that's true.
But we aimed at some diversity in competence as we also needed
people with domain knowledge.
I mean, offshore engineering and so forth.
The group became a mixture of technical people as well as social
scientists.
But as you said, all should have high competence in safety risk and
have interest in developing that field and discipline.
Our goal was to develop a new type of graduates who would call
themselves risk or safety analysts or scientists, not only engineers
or social scientists.

[SPEAKER_01]
And this is summarized in the third lesson.

[SPEAKER_00]
Yes, lesson three.
Generic competence in safety and risk should be highlighted in the study programs and when recruiting professors.

[SPEAKER_01]
Students are very different.
Some enjoy more the practical parts than the academic parts and vice versa.
How did you find the proper balance between practical and theoretical or academic parts?

[SPEAKER_00]
This is always a challenge.
There are students who want to see more applications and examples and even specific computer codes.
But there are also those who strongly appreciate the theories and generic knowledge.
I strongly believe that the most important is to focus on the fundamental generic thinking ideas, principles, but also approaches and methods that are core knowledge of the field and not being outdated in some few years.

[SPEAKER_01]
You mentioned that your institution was not authorized to award PhD certificates, but that changed in the late 1990s.
Could you say some words about that?

[SPEAKER_00]
Yes, but I can tell you it was a difficult process to get that right, to be allowed to certificate our own PhD students.
The minister in the 90s was very negative to giving us such a right and authority.

[SPEAKER_01]
Why was that?

[SPEAKER_00]
I asked him and he said, if we get it, other institutions should also get it.
And that would destroy his high-level structure for how the university college system should operate with clear rules for the different institutions.

[SPEAKER_01]
I guess you were not so happy about this policy.

[SPEAKER_00]
No, for me, this was absurd.
We had the competence, but needed to collaborate with other institutions abroad also that had all the formal rights, but not necessarily risk or safety competence.
So they could give us the formal certificates.
But all the work and supervision were carried out in Stavanger.

Yes, this was absurd.
But things changed with our new government and minister.

[SPEAKER_01]
And you were strongly involved in this process.

[SPEAKER_00]
Yes, I can remember all the documents I wrote and all the talks I
had trying to explain and convince politicians and others that
having our own PSD was critical for the development of our
institution and our feel and discipline of safety and risk.

[SPEAKER_01]
That sounds impressive.
Impressive and hard work.
Could you please explain?

[SPEAKER_00]
Yes, I remember a slide I often used explaining why this was so
important.
Some points from there.
Seen from outside, we do not have the same quality as other
institutions as we do not have the full rights and authorities.
Another one, our students does have a handicap compared to others.
Another example, easier to recruit top scholars.
And finally, there's basically no cost involved.
We have the competence and infrastructures.

[SPEAKER_01]
And this was also personally important for you?

[SPEAKER_00]
Yes, it was embarrassing, to be honest, to communicate that we were
a leading environment on risk and safety, but we were not allowed to
certificate the PhD students in the education system.
We were not placed in the top league, but the level below.
I was at that time supervising PhD candidates in maintenance
planning, blowout risk, emergency preparedness, economic accidental
risk analysis, and risk analysis in construction phases of a
project, based on agreements with Aalborg University (Denmark),
Robert Gordon University in Scotland, and Norwegian Institute of
Technology.

[SPEAKER_01]
Is there a lesson we can draw from this?

[SPEAKER_00]
Yes, leading to lesson four.
Building a top scientific environment needs full rights and
authorities on all levels, including PhD.
And if you do not have it, you need to fight for it.
One important aspect here is that the PhD programs
stimulate research and is generating candidates for the university
positions as professors and this is so important in particular for a

new field and discipline like safety and risk.

[SPEAKER_01]
But I guess you would not like to only recruit candidates from your
own institution?

[SPEAKER_00]
No, not all professors in the group should be educated from the
institution and be local of course.
A mixture is preferred, but a certain percentage should be as that
ensures some level of unity, stability and loyalty to the project
being developed.

[SPEAKER_01]
But your institution was still not a university about year 2000.

[SPEAKER_00]
Yes, that's true.
But the breakthrough really came when we were allowed to award our
own PhDs in the late 90s.
Next, we needed to demonstrate that we had the highest level in four
areas, among other things, to become a university.
And the risk and safety topics played a very important role.

[SPEAKER_01]
Offshore technology was one of these four areas, I understand.
And safety and risk was a central topic in that area.

[SPEAKER_00]
Yes, it was.
But safety and risk also became a separate area, the fourth pillar
of the application.
We call it risk management and societal safety.
It became the fourth area.
Late 2004, it was a reality.
We were accepted, upgraded to a university.
How did you feel?
Well, that felt really good.
We got all the important rights and authorities and we could focus
on the science and not all of these other administrative formality
issues.

[SPEAKER_01]
During these processes, your institution and in particular the risk
and safety group were extensively evaluated.
Could you point to some conclusions and recommendations from the
evaluations?

[SPEAKER_00]
Yes.
We got a lot of nice feedback and we met the formal requirements
concerning, for example, research, study programs, professors,
international networks, infrastructure, quality assurance, and fine
mixture of generic and applied activities, impressive local support,

extensive international collaboration, and the committees liked our ideas and plans.
We were doing something new and unique internationally with the potential for further development.

[SPEAKER_01]
But they also pointed to some challenges.
Could you mention some in relation to the safety and risk programs?

[SPEAKER_00]
Yes, they did.
They stated that the programs were ambitious, and in particular in relation to connecting the different topics and subgroups.
And I can mention that we followed up this issue later by moving scholars from social sciences to our Department of Economics, Safety and Planning.
Another issue, suggestion, or challenge was this dependency of some key scholars
That was an issue at that time, but gradually it has been reduced with many professors now in the group.
And a last challenge that I'd like to mention is the need for establishing a center for further developing the area.

[SPEAKER_01]
And that led to the establishment of the SEROS Center, that means Center for the Risk Management and Societal Safety or Security.

[SPEAKER_00]
Yeah, that was established in 2003, I think.
It was the tool we developed to run the university's external activities on safety and risk, research, consultancy, training and conferences.
It had three pillars on risk and societal safety and also industrial economics.

[SPEAKER_01]
SEROS dealt with external projects, EU projects, National Research Council projects, etc.
Are such programs important for the development of a top international center?
What do you think?

[SPEAKER_00]
I think it varies.
We see many top universities and environments worldwide that are very much built on such external projects, but also many strong groups with a rather low profile on such projects.
I think taking part in such projects and also taking a leading role is something one should do to enhance one's network, be visible and hopefully obtain interesting and important results.
But I say not too much of such projects as they could be very resource demanding and the outcome are not always that impressive.

[SPEAKER_01]

And this is summarized in lesson five.

[SPEAKER_00]
Yes, lesson five, take part in and lead external projects, but not too much.

[SPEAKER_01]
How has your research been funded?

[SPEAKER_00]
University positions in Norway are fully funded and the professors get approximately 50%, some less, some more, of their working time paid to the research.
or apply for research project funds.
And that, of course, helps to be able to conduct research which are not organized as a project.
Personally, I have always had a mixture of project-based research and development projects and my own driven research papers and books.

[SPEAKER_01]
Is SEROS still up and going?

[SPEAKER_00]
It was formally closed some few years ago, but there is a continuous discussion in the group how we can revitalize the center as we need SEROS to make it visible who we are and what we do and also support our external activities.
Why was SEROS closed?
It's always a question about cost and benefits.
A lot of practical things we take care of anyway, and we should be careful adding activities outside the ordinary department functions.
The SEROS centre was especially important when the group had members coming from different departments.
Now, after we merged and are all in the same department, the need for the centre was reduced.

[SPEAKER_01]
I hope SEROS will be revitalized because it is so important for the group.

[SPEAKER_00]
Yes, yes, we are working for that, and I hope so too.
And that leads us to lesson six.
A center could be essential for the development of the area, in particular in the early stages of the area, to unify the group and discussing and agreeing on the way forward, and in particular to support the handling and coordination of external activities.

[SPEAKER_01]
I have here an overview of the development of the master programs at the University of Stavanger from 1980s until today.
Is it a correct interpretation that the programs have become more general over the years and that the engineering dominance has

gradually been weakened?

[SPEAKER_00]
Yes, this is correct.
We went from petroleum offshore specializations to risk management
and risk analysis and governance, in addition to societal safety and
security.
Now programs are offered to students coming from all types of
backgrounds and educations at the bachelor levels.
We still have engineering students, but the number have gradually
been smaller.
And that's an international trend in the West that engineering
programs struggle.
There are fewer engineering students.

[SPEAKER_01]
One could then ask, is this something general that you would
recommend, going from some application-oriented programs to more
general programs?
Or would it be better today to start directly on a generic risk or
safety program applicable for different applications?

[SPEAKER_00]
I think one should be careful being categorical on this, as there is
always a local and national context.
We in Stavanger would not have been able to develop a generic
program, say, in risk management in the 80s and 90s because of
national policies on education, but also because it would not have
been supported at the university.
There were no academic foundation for genetic risk and safety
studies at that time, and there would have been serious
uncertainties about students being able to get jobs.

[SPEAKER_01]
So it makes sense to take one step at a time.

[SPEAKER_00]
Yes, find a direction of focus where you have support and can
deliver results.
Students with a degree who get jobs.
Then produce candidates at the highest level that could later be
your colleagues, at least some of them.
Grow and meet the needs of the society while at the same time
building generic competence on risk and safety security so that you
can adapt to new hot topics popping up.
That is what we did, and I think it's a strong model, but it must,
of course, be adapted to the situation locally and nationally.

[SPEAKER_01]
And all this you will summarize in lesson seven?

[SPEAKER_00]
Yes, lesson seven, a gradual development starting from something
specific to more broader and more generic programs is in general

recommended.

[SPEAKER_01]
How important are champions for being successful in such a development?

[SPEAKER_00]
I think they are critical to sell the program.
As the field discipline is young academically, people are skeptical and then it's important to have persons with authority and high academic standing that can argue for the field and program.
It's difficult to build a top center without having one or more top persons already at university who can take responsibility for the work and is really committed and enthusiastic about the program.
That is lesson eight.
We need one or more champions to run and sell the project.

[SPEAKER_01]
I guess you need an entrepreneurial attitude.

[SPEAKER_00]
Absolutely.
There are risks involved with a lot of uncertainties.
But if nobody are really convinced about the plans and are willing to work super hard to be successful, you have not a chance normally, I would say.

[SPEAKER_01]
But one needs financial support, of course.

[SPEAKER_00]
Yes, but you cannot sit and wait for the money to come before you start the work.
In our case, the basic thinking was this:
Let us do it and show that things work, and then hope that we get more support later.
It worked in most cases.
The other approach is not to start the programs before one has got all the money needed, but I would say if we had used that approach, we would never have been able to be in the position we are today.

[SPEAKER_01]
And this leads to lesson 9.

[SPEAKER_00]
Lesson 9.
You need to be willing to take risks and start activities before you have all the resources needed,
funding and also approval, formal approval.

[SPEAKER_01]
What are the personal qualities or features, in addition to scientific or academic merits, that are especially important for those involved in such development, these champions?

[SPEAKER_00]
There are many, I would say, but I would like to highlight these.
Being creative, patient and strategic, convincing and hard-working.

[SPEAKER_01]
Can you motivate these features?

[SPEAKER_00]
Yes, creative.
There are a lot of obstacles.
You need to find ways around them that requires that you are
creative and looking for new and alternative ways of doing things.
You cannot be too rule-based.
Creative interpretations are often possible.

[SPEAKER_01]
Can you give an example?

[SPEAKER_00]
I mentioned the example earlier in the 90s when we were not allowed
to offer master programs in general engineering subjects.
And we designed offshore technology, which allowed for the
development of all the generic subjects we wanted using the
politically correct offshore umbrella.

[SPEAKER_01]
And next features were being patient and being strategic.

[SPEAKER_00]
Yes, it can take a long time to develop an academic environment.
We need to think typically 10 years at least.
That requires patience and strategic thinking, building brick by
brick and seeing the big picture.
One needs to have clear visions and high-level goals.
What do we like to develop?
At the same time, being flexible as the way forward is full of
challenges, obstacles and barriers to be solved and overcome.

[SPEAKER_01]
Did you have a clear understanding early on what should be the high-
level goals for the University of Stavanger and its activities on
safety and risk?

[SPEAKER_00]
That's an interesting question.
I must be honest and say that in the 80s, I didn't think about the
safety and risk area becoming something like it is today in
Stavanger.
Then I just worked hard every day to get things up and going.
Not so much long-term reflections.
Things changed in the 90s.
I became assistant dean, later the dean, and the strategic work
became really important for me, for the safety and risk area, but

also for the technical school and university more broadly.

[SPEAKER_01]
Then some specific visions and goals were formulated.

[SPEAKER_00]
Yes, the goal was to develop a top national and international
environment on safety and risk, on education and research, a leading
scientific center in this area.
Then a key was to obtain all the rights that a university can give
to offer PhD programs and be authorized to award PhD certificates
and being approved as a university, as discussed earlier.

[SPEAKER_01]
And what about being convincing?
Not all academic persons are good sellers, I think.

[SPEAKER_00]
Yes, that is true, but it's important in a process like this one
that we are now discussing.
It's a lot about being convincing and selling your ideas and
product.
Academic leaders are facing numerous suggestions for new programs
and academic positions.
Why should they listen to you if we cannot prove that the plans are
realistic and more than just interesting and promising?

[SPEAKER_01]
What do you think were of special importance for the development at
University of Stavanger in this regard?

[SPEAKER_00]
I have mentioned the support from external parties, industry and
agencies.
One other point I would like to mention is the rather technical,
mathematical, statistical basis we adopted in the early years in the
1980s when looking for the approval in the engineering and technical
environment.
The program was perceived as technically solid for this reason.
In later developments, for example, when applying for the Risk
Management and Society Safety PhD program,
we needed to sell broader competences, combining technical-oriented
people and social scientists.

[SPEAKER_01]
And finally, hard-working.

[SPEAKER_00]
Yes, and that should not be difficult to motivate.
If no one is willing to do an extraordinary job, it is not likely
that one will succeed.
It's time to summarize all this in lesson 10.
Lesson 10.
To be successful, for example, developing a top academic at the

center, you need to be creative, patient and strategic, convincing and hardworking.

[SPEAKER_01]
What makes a professor enjoying working with safety and risk?
It is not only hard work, I suppose.

[SPEAKER_00]
There are differences, but most of my colleagues like their jobs with a combination of teaching, research and administrative work.
A key, of course, is the personal freedom that we have as professors to work on things we like.
The position would link you to a specific program, and there could be expectations that your research supports that.
If your students are on a program in offshore engineering, you should have some insights about this industry, although your scientific work is mainly directed at safety and risk issues.

[SPEAKER_01]
There could be some tensions here, for sure.
If your heart is really on something else than the study program you are linked to.

[SPEAKER_00]
Yes, true.
But I think most professors are able to find the right balance between duties on education and research activities and personal research interests.

[SPEAKER_01]
You have also highlighted the need for mentors.

[SPEAKER_00]
Yes, that is important.
To further develop, we all need people that could challenge you, but also protect, support and motivate you.
And that is mentors.
Mentors are important for young scholars, but also if you are in the late 40s and early 50s and later.
If not, one can easily stagnate as you do not open up for ways that can improve your work.

[SPEAKER_01]
Finally, a question about the future.
What will it bring when it comes to risk and safety education at the university level?

[SPEAKER_00]
At our university, I do not expect huge changes in the near future.
Our programs are doing fine.
Of course, we do adjustments all the time, but I see no need for dramatic changes in the near future.
AI does not change that in my view.
A key success in my view of our programs is the focus on generic

fundamental concepts and principles, the thinking.
And that is rather stable and not changing that much.
Well, our field is not like basic mathematics.
There are changes and improvements all the time, and in particular for the applied paths.
But focusing on the generic paths, it is still to be seen as rather stable compared to programs that are more applications oriented.

[SPEAKER_01]
You have presented 10 lessons.
If you are to summarize everything into one or two key messages, what would they be?

[SPEAKER_00]
Well, the core message I would say is this.
If you are to promote risk and safety security and develop a top environment in this area, generic risk science and safety need to be focused more than applications.
It is not either or, but the generic part is what makes you the true experts compared to the other domain experts.
Then work hard and smart, as I have stressed throughout the podcast.

[SPEAKER_01]
Thank you very much, Terje, for your insights and lessons learned, you said.
I hope they are useful to the audience and especially those who are planning to establish a risk and safety science discipline at their universities.
I hope this podcast encourages people to make efforts at the risk and safety field and to make their dreams come true.
Thank you.

[SPEAKER_00]
Thank you, Marja.