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No. s-96-21 October 21, 1996

PERSPECTIVES ON NUCLEAR REGULATION

BY

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AT THE

ANNUAL LECTURE OF THE COUNCIL FOR NUCLEAR SAFETY
PRETORIA, SOUTH AFRICA
SEPTEMBER 26, 1996

SAKUBONA (Zulu)
MOLO (Xhosa)
LUMELA (Sesotho)
GOOIEDAG (Afrikaans)
GOOD MORNING [AFTERNOON]

I am genuinely thrilled to be here in Pretoria today to deliver this annual lecture sponsored by our sister regulatory agency, the Council for Nuclear Safety (CNS). I am at the beginning of my first visit to your beautiful and exciting country. I was fortunate enough to arrive on your national holiday, Heritage Day. So, instead of beginning my visit in offices and meeting rooms, I was able to begin it in the Pilanesberg Game Reserve, relaxing with representatives of the Council for Nuclear Safety, my family, and others, and observing some of the splendid creatures we Americans only get to see in zoological parks or in picture books. I think this was a good way to start, getting a feeling for the land and people before getting down to professional discussions. But I am now looking forward enthusiastically to the official side of my visit.

The political changes which have engendered a new, democratic South Africa have opened opportunities for broader cooperation between our nations in a host of areas. This summer in Washington I was privileged to participate in the second meeting of the U.S.-South Africa Binational Commission (Gore-Mbeki Commission), headed by our Vice President and your Deputy Executive President. This binational Commission is an important mechanism through which the United States intends to work with South Africa to achieve concrete progress in many

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areas--economic, social, cultural, scientific and technological. Nuclear energy and safety were on the Gore-Mbeki agenda. In these important fields, past differences now have been put aside and the way cleared for mutually beneficial efforts. During my visit, I hope to make further progress on identifying specific areas in nuclear safety and regulation which we can pursue together.

The CNS was thoughtful enough to suggest three subjects of particular interest to you. These are: first, the funding of regulatory activities; second, regulatory independence; and third, regulating previously unregulated activities or imposing new requirements on existing facilities. I am happy to address each of these issues today, as well as to add some comments on one issue of particular interest to me--nuclear security.

PRINCIPLES OF GOOD REGULATION

I would like to begin by placing these subjects in context. Indeed, they all fit well into a structure of the Principles of Good Regulation the U.S. Nuclear Regulatory Commission (NRC) has adopted to guide our own work. These five principles may seem rather obvious. They are: Independence, Openness, Efficiency, Clarity and Reliability.

[At the entrance to this room, I have left copies of the NRC official version of these Principles to provide a bit more detail on how we apply them.] I will not go into further detail on the principles here, but only indicate that applying them in practice is a good deal more complex than might appear at first glance. You will get some flavor of this complexity as I discuss their application to the topics the Council has asked me to discuss. I can say that these five principles touch virtually all regulatory issues which must be addressed by nations choosing to exploit nuclear energy (and particularly nuclear power). I recommend them for your consideration as useful aids in managing this complex technology successfully and safely.

FUNDING REGULATORY ACTIVITIES

Economics lies at the heart of decisionmaking regarding any industrial undertaking, including the use of nuclear energy. Fortunately, you have not asked that I join the debate over the comparative economics of nuclear power versus other sources of electricity. That issue not only lies beyond my specific responsibility as a regulator, but it also involves many factors unique to each nation--and often specific regions within a nation. On the other hand, I could discuss the issue of how we fund nuclear regulatory activities in the United States for hours. But, do not despair--my focus here will be on fundamentals only.

Regulation is one key mechanism used in market economies to assure that industrial activities are conducted in a manner consistent with society's needs. If you will, regulation is the price we pay for freedom from total

state ownership and control. Since their origins in the 19th century, regulatory agencies in the United States have typically exercised three basic functions: 1) standard-setting (or rule-making); 2) verification of compliance with rules; and 3) enforcement. Each of these functions costs money.

There can be no question that assuring adequate resources--human, financial and technological--for nuclear regulation is a fundamental pre-requisite to protecting public health and safety. In fact, that concept recently has been embodied in international law under Article 7 of the new Convention on Nuclear Safety, which states that each nuclear regulatory body shall be "provided with adequate authority, competence and financial and human resources to fulfill its assigned responsibilities." The Convention, however, does not specify how that is to be achieved. Each government must determine for itself how much should be spent on regulation and how these costs should be apportioned. In other words, what resources are "adequate".

Most nations fund their nuclear regulatory activities through tax revenues assessed generally--albeit from different sources (namely, income, sales, business, excise, export-import, value-added taxes or others). In nations with a single electric utility, particularly if state-owned, a tax-based approach has a certain logic. In such cases, tax funding is simple, equitable and cheap to administer. This approach was used by the U.S. to finance the major portion of nuclear regulation until comparatively recently. However, even before the U.S. Nuclear Regulatory Commission was created in 1974, our predecessor agency--the U.S. Atomic Energy Commission--charged some direct and annual fees to its licensees to support its regulatory program. In 1985 Congress required us to collect 33 percent of our budget in fees. That figure was raised to 45 percent in 1988; and to 100 percent in 1991.

Under this full-fee recovery system, essentially the entire NRC budget is funded through fees collected from our licensees--110 licensed power reactors, 44 non-power reactors, including many universities and 9 major fuel cycle facilities--and the large number of commercial entities licensed to possess nuclear materials for industrial, medical, agricultural and other purposes.

Many issues arise from the shift from taxation to fees as a mechanism for sustaining a nuclear regulatory organization. I shall only mention a few of the most important.

The first is the relationship of our fee-assessment authority to the overall national budget process. Although our ability to set and collect fees has provided the NRC with some degree of insulation from budget deficit reduction pressures which are now facing many governments worldwide, our freedom is not absolute--nor should it be. As a federal agency, we are a creation of the legislative and executive branches, working through our constitutional process. As I will discuss later, independence is a vital aspect of effective regulation; but we recognize that our Congress and President must have a strong role in making decisions regarding the level of resources to be committed to nuclear regulation. Therefore, our authorization to collect and

to spend licensee fees is governed by national legislation. We must operate within limits established annually through the regular budget process of the U.S. Congress and codified in an appropriations bill.

Our role is to make clear what we need by way of resources to protect public health and safety. We do this through submissions to the Office of Management and Budget during the Administration's preparation of the President's annual budget; and then directly to the Congress in hearings and discussions with committees having jurisdiction over our work. A key aspect of this process is our ability to state an independent view on whether recommended budget levels for the NRC are adequate for us to implement our responsibilities. This is central to maintaining the principle of "independence" I mentioned at the outset.

The second issue, intertwined with the first, is how we assess fees. This implicates nearly all our principles of good regulation, including "openness", "efficiency", "clarity" and "reliability." We have been acutely conscious of the need to justify our fee system in a transparent and objective manner. In a field where public confidence is vital, nuclear regulators must avoid any suggestion of levying or inflating fees simply to meet a certain funding level. We cannot be viewed like a traffic policeman who collects a daily quota of fines from whatever hapless motorists drive by, just to increase the police department's budget. Conversely, we cannot allow pressure from the industries we regulate to reduce our budget - and fees - to a level which does not allow us to assure adequate protection. Over the last five years we have made a great effort to develop a fee structure which is fair, open and efficient. Many difficult issues have arisen in this complex process.

One of those issues is the shifting of funding from the public - through taxes, to the private, regulated community - through fees. This idea sounds simple, but it raises rather profound issues about the proper role of government in a modern economy. Recent initiatives in the U.S. seek to make government more relevant to the needs of the persons, businesses and other organizations it serves. I strongly support these "reinventing government" efforts to improve the way we serve our "clients". However, a core concept espoused by some government "reinventers" is that governmental and private sectors are essentially alike and subject to the same behavioral norms. Government, in this view, is primarily a service delivery entity whose proper role is to satisfy customers. But, for a health and safety organization, it is important to clarify specifically who are our primary customers. For example, on the reactor side, are our "clients" the utilities who pay our fees? The customers of those utilities? Other citizens who might be at risk if a reactor accident were to occur? The public at large? We must be wary about adopting too a narrow a focus on client satisfaction, one which could cause us to give short shrift to our primary mandate to protect public health and safety, and our accountability to the established political process.

The NRC assesses fees through a rather complex system which weighs many factors, and I shall not go into those here today. If you are interested in such details, I would be happy to provide the report our Commission furnished

to the U.S. Congress in February of 1994, responding to a requirement in the 1992 Energy Policy Act to review our licensee fee policy. That report was based on an extremely thorough review of our fee system, including voluminous comments from our "stake-holders"--including the nuclear industry, federal and state agencies, universities and private organizations and associations, and the public at large. That study identified both strengths and weaknesses of our approach. Let me mention only briefly some of the major concerns identified in this review.

First, not all beneficiaries of NRC activities pay fees. In this category are certain international partners with whom we cooperate and entities who benefit from our generic activities, such as research or rulemaking. Second, some of our licensees do not believe that our fees are commensurate with the benefits they receive--not an entirely surprising reaction from anyone dealing with government. This concern especially has been voiced by smaller licensees. It also reflects the fundamental difference in perspective between NRC and its licensees. Licensees operate businesses and, of course, measure the benefit of their license primarily by its economic value to them, not by its contribution to maintaining adequate health and safety throughout our society. And if a license fee becomes disproportionate to economic return, licensees will simply leave the nuclear business. A third concern, of both the Commission and licensees, involves the burden of administering the fee system. In its initial phases, it must be conceded that the process for assessing and collecting fees was not as efficient and "user-friendly" as it might have been.

In response to these and other concerns, we have made adjustments to our fee system--and we will continue to make more. With regard to unfunded activities not directly related to our licensees, but which involve vital responsibilities as a Federal agency, the Commission has recommended some legislative changes to substitute general tax revenues for the approximately 10 percent of our budget devoted to these activities. However, except for funds for specific projects or activities, the Congress has not taken up these suggestions, preferring to maintain the current approach which spreads all cost of conducting our regulatory program among NRC licensees and applicants. With regard to the cost/benefit picture, we have made certain adjustments to our fee schedule; to give some relief to smaller licensees in particular. Additionally, we have in turn certain measures to streamline our assessment and collection process, such as reducing the number of sub-classes of licenses and eliminating certain procedural requirements, such as notice and comment rulemaking.

Is the U.S. full fee recovery system perfect? Certainly not. Should it be adopted by all nations for funding their own regulatory organizations? Certainly not. However, I would say that implementing such a system sharpens our understanding of key issues, such as the cost/benefit assessment of regulation. Fee-based funding establishes a clearer economic link between the total costs of a nuclear power program, including necessary regulatory oversight, and the benefits resulting from that oversight.

In sum, I believe our system warrants a look by other nations as one means of funding nuclear regulation in an adequate, predictable, independent, yet politically responsible manner.

REGULATORY INDEPENDENCE

The NRC's first principle of good regulation is "independence"; meaning, essentially, that our responsibility to protect public health and safety comes before other considerations--political, economic or bureaucratic. Our decisions must be based on objective, technical assessments developed by a staff who conduct themselves according to the highest ethical and professional standards.

We assure our independence in a number of ways. The first is institutional. In 1974 the U.S. Congress determined that the U.S. Atomic Energy Commission, in existence since 1946, should not exercise both regulatory and promotional responsibilities regarding nuclear energy. Congress felt that a separate agency, not under the direct political control of the Presidential Administration, should exercise final authority in the complex and sensitive area of nuclear and radiation safety, especially in the civilian arena. Therefore, the U.S. Atomic Energy Commission was abolished and, in its place, was created the U.S. Nuclear Regulatory Commission and the Energy Research and Development Administration (ERDA), which has evolved into the U.S. Department of Energy.

This same approach has now been codified into international law in Article 8.2 of the Convention on Nuclear Safety. This article states that there should be "an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy." "Effective separation" can be achieved in a variety of ways. However, we have found that placing regulatory and developmental functions in completely separate organizations, with separate lines of management responsibility is the simplest and most effective way to assure both that we are able to act independently of other interests, and that we are seen by the public to act independently. In fact, the International Atomic Energy Agency has recently made a similar separation between its Nuclear Safety and Nuclear Energy (development/promotion) activities.

Further, policy direction of NRC is vested in a collegial body of five members, each of which is appointed by the President and confirmed by the United States Senate for a term of five years. No more than three of the five Commissioners can be members of a single political party. And one Commissioner's term expires each year. This is intended to permit regular turn-over of Commission membership, providing new perspectives while maintaining continuity. One of the members is appointed as Chairman by the President. The Chairman is the Principal Executive Officer of the NRC, and directs and supervises the work of the staff through the Executive Director for Operations, in accordance with Commission policy. The Chairman is the official spokesperson, and acts for the Commission in a nuclear emergency.

Finally, I have already discussed our full fee recovery system, which gives us a measure of added independence.

Our independence is also importantly affected by our adherence to another of the good regulation principles--openness. The Commission's decisions must be made under our "Government in the Sunshine Act." This means that a majority of Commissioners cannot even discuss, let alone decide, an issue before the Commission without giving prior notice and an opportunity for public to attend such a discussion. There are some exceptions to our "Sunshine" rules, to enable us to discuss sensitive proprietary or security information or personnel matters. But those exceptions are narrowly defined and we can use them only after making a public decision to do so, which is formally recorded.

We also have a licensing process for nuclear facilities, which guarantees a broad right of participation to interested parties, including the right to appeal our decisions to the federal appeals courts.

Some critics have suggested that these mechanisms for assuring independence are cumbersome and costly. Perhaps so. However, in the often controversial area of nuclear energy, we have found that public confidence in the safety of this technology can be significantly increased by the knowledge that decisions will be made openly, on the basis of legally-established factors, supported by clear evidence, by persons who have a reasonable measure of insulation from direct economic, political and social pressures. In this we resemble the independent judiciary in our federal court system; an appropriate model, given that we exercise quasi-judicial functions in our licensing process. In fact, any appeals of Commission decisions are made at the Federal appeals court levels. Is the expense and inconvenience worth it? My own assessment is decidedly "yes."

REGULATING NEW ACTIVITIES AND BACKFITTING OLD FACILITIES

A central problem for any social or political institution is adjusting to change. One of NRC's Principles of Good Regulation I mentioned earlier is "reliability". This concept means many things, but it certainly means that our regulatory regime must have stability over time; namely, that we will not impose new requirements on existing activities, or extend our regulation to additional ones, in an arbitrary or capricious manner. Indeed, these are two of the issues your Council has asked me to address today. Reliability in a rapidly-developing industrial, economic and technological setting must be achieved by balancing stability and change. Saying this and achieving it are, of course, quite different kettles of fish.

With regard to imposing new safety requirements on currently operating facilities, we have adopted a procedure codified in what is called the "Backfit Rule," which can be found in Volume 10, U.S. Code of Federal Regulation, Part 50.109.

Backfitting of safety requirements under the rule can be performed for three basic reasons. These include:

First, to bring a facility into "compliance" with existing regulations;

Second, to ensure, define or redefine "adequate protection" of public health and safety; and

Third, to obtain a "substantial increase" in the overall protection of public health and safety.

The majority of backfitting issues have come under the compliance category, which is generally the most straightforward to evaluate. In fact, one could argue that such steps are not really "backfitting" at all.

The "adequate protection" justification has been used far less frequently. One example of NRC's imposition of new requirements has been the pressurized thermal shock rule [10 CFR 50.61], where we judged it necessary to reflect new data on reactor pressure vessel embrittlement, which could have major safety significance concerning the integrity of the reactor pressure vessel and containment in certain circumstances. Another example is a Bulletin we issued in 1989 [89-03] to increase the shutdown margin in spent fuel pools.

The "substantial increase" standard is more subjective and can be invoked on a qualitative, as well as quantitative, basis. Generally, the NRC staff endeavors to quantify the benefits of a proposed backfit, to the extent feasible. However, in cases where the safety benefits of a backfit cannot be entirely quantified, a flexible approach is warranted. For example, incorporation of revisions to industry standards into NRC rules can provide the basis for a finding that a proposed backfit meets the "substantial increase" standard.

With regard to power reactor backfits other than for "compliance" or "adequate protection" reasons, the rule requires what we have called a "backfit analysis". This analysis includes the estimated potential impact of changes in plant or operational complexity, potential impact on radiological exposures and the estimated resource burden on the NRC and the licensee.

Due to the potentially complex and controversial nature of backfitting considerations, the NRC has incorporated evaluation of such issues as a key element in the responsibilities of our Committee for Review of Generic Requirements [CRGR]. The Committee was originally established in 1981, and consists of experienced NRC senior managers. It has been tasked with eliminating unnecessary burdens on licensees, reducing exposure to workers, and conserving NRC resources--all, of course, while ensuring protection of public health and safety. The CRGR has significantly increased the technical thoroughness and consistency of NRC positions regarding backfitting of safety requirements. As such, it is a key mechanism for our implementation of the principles of both clarity and reliability in good regulation.

Your Council also asked me to address another aspect of regulatory change; namely, the extension of regulatory oversight to activities which have not previously been subject to regulation. Let me say, at the outset, that the U.S. nuclear regulatory system has been relatively stable since 1974, when the former Atomic Energy Commission's regulatory and developmental

responsibilities were assigned to separate organizations. The scope of the NRC's regulatory reach has not changed fundamentally since then. We regulate civilian nuclear power reactors, research and test reactors, fuel cycle facilities and a large volume of licensees who use nuclear materials for industrial, medical, agricultural and research purposes. We also license and regulate both low-level and high-level radioactive waste storage and disposal facilities. We are authorized under federal law to transfer certain of our responsibilities (largely in the radiation protection area) to the states under formal agreements. However, we must make a continuing determination that these state regulatory programs are compatible with the NRC regulatory system. We can terminate state agreements where adequate standards are not maintained.

There is one industrial area in which we are in the process of extending our regulatory reach. That is to the uranium enrichment facilities historically operated by our Department of Energy, which now are being privatized under the United States Enrichment Corporation (USEC). Obviously it is a major task for us to regulate such an industrial program, one with plants built in the 1940's and 1950's to fill our nation's defense needs. Indeed, we currently are implementing a new kind of regulatory regime which makes sense for such facilities. Referring back to our principles of good regulation, we had to assure that the system we adopted would be independent, open, clear, efficient and reliable. To accomplish this result, we knew and the Congress believed that imposing the full panoply of our licensing system (basically designed to be applied throughout a long process of design, siting, construction and operation of a civil nuclear power plant) would not be appropriate. Rather, we are implementing a system of "certification" which involves a very thorough technical review of health and safety issues, but which does not include all the procedural steps we would require for a new reactor. Under this "certification" process, we have required USEC to submit a well-documented safety analysis report on its plants. We have reviewed this in detail. We are about to issue Certificates of Compliance to the USEC. This certification will give the corporation a certain period of time, after certification (on the order of six months), within which to comply with our requirements.

In addition to the USEC facilities, the NRC could also be given regulatory responsibilities over a range of additional government nuclear facilities. These are basically nuclear facilities currently operated by the Department of Energy which have been subject to a type of internal regulation. Although the Commission has not actively sought these new responsibilities, we have told the Congress that we would be prepared to exercise them if they were given to us. We also have told the Congress that any significant expansion of our role would require appropriate resources--both in terms of funding and personnel allocations--to do the job adequately.

At present, the Department of Energy is evaluating further the issue whether to seek such external regulation, which would require legislative change if adopted on a broad basis. There are a number of Department of Energy activities, which if undertaken, might fall naturally within the NRC regulatory domain, in the absence of legislation.

We intend to be rigorous and independent in our oversight of any facilities we regulate. I believe the Congress understands that to be the case and will give us the tools needed to adequately fulfill any new responsibilities that may be assigned to us.

One way the NRC is adjusting to change is through a very comprehensive self-examination. Last year I launched a strategic assessment and rebaselining initiative at the Commission, to look at all areas of current or potential NRC activity (including regulation of additional activities) and to propose alternatives for how we would meet those responsibilities. A special steering committee has been preparing detailed issue papers for the Commission's review and these papers, and the preliminary views of the Commission, are being circulated for broader comment. We intend to meet our principle of "openness" by seeking comment from those both inside and outside the agency who are affected by our work. Such a bottom-to-top look at an organization's structure and programs on a periodic basis can be important for keeping up with change of all types, whether internally or externally generated, whether technological or policy-based, whether fundamental or marginal. This exercise will result in a new NRC Strategic Plan and associated Performance Plan, which will form the basis of our FY 1999 and subsequent budgets, and any agency rebaselining which might occur.

SECURITY

A final area of nuclear regulation I would like to mention involves the issue of security. One of the burdens nuclear energy continues to bear in being fully accepted by our publics lies in its origins as a weapons technology. Nuclear weapons were originally developed by the United States during the second global war of this century--hopefully the last of any century. And, it was a decade later that President Eisenhower's 1953 "Atoms for Peace" initiative led to broad international cooperation in using this technology for economic and social development. For the last few years we have slowly, but steadily moved away from the so-called "balance of terror"--the central feature of the Cold War.

It is well beyond the scope of this lecture to go into the complex and difficult field of nuclear disarmament. However, there is one aspect of our mutual retreat from reliance on nuclear weapons that I particularly want to mention.

One especially meaningful opportunity afforded by my visit here is that it enables me to personally commend and thank South Africa for its outstanding contribution to global nuclear security during the process of extending the Nuclear Non-Proliferation Treaty (NPT) last year. South Africa was uniquely positioned to play a leadership role in this process, and did so with thoughtfulness and commitment. South Africa is a developing nation with recognized economic and industrial attainments, which give it a strong voice among nations seeking to achieve progress in these fields. South Africa is a nation which had developed a nuclear weapons capability, but then saw that it

would not enhance world peace, regional stability or South Africa's own security. South Africa's emergence from an oppressive apartheid system to a robust democracy also increased the political weight of your views. For these reasons, South Africa has been able to engage the NPT debate on all levels: technical, economic, political and--yes--moral.

The indefinite extension of the NPT last year has made the world a safer and more predictable place, and South Africa deserves much of the credit for that result. South Africa also led the way in establishing a process of "enhanced review" of the Treaty, a process which will begin next year. This process will ensure that key issues of how the NPT is being implemented will receive meaningful attention. The United States is committed to support this process actively, and to work with South Africa in strengthening the NPT system.

You may be wondering how this relates to the issue of nuclear regulation? My answer is that the use of nuclear energy for the production of electric power, and nuclear materials for other peaceful purposes, can only proceed if the world's governments and peoples are convinced that the technology will not be turned to destructive purposes. In this light, security has both a national and an international dimension.

On the international level, the NPT is the central juridical instrument for assuring that nuclear energy will be used only for peaceful purposes. The system of safeguards established under Article III of the Treaty is a critical means of verifying the pledge against nuclear proliferation contained in Articles I and II. And also, the undertaking of the parties under Article IV, to facilitate the "broadest possible exchange" in the peaceful uses of nuclear energy, is an important guarantee that nations foreswearing nuclear weapons will not be denied access to the benefits of this technology for economic and social development.

The NRC works in consort with other U.S. agencies, and with the IAEA and other nations, to assure that the international safeguards system is as reliable and efficient as possible. In that light, we have been pleased to work with South Africa to support the so-called "93 plus 2" initiative to enhance IAEA safeguards. The elements of "93 plus 2" can help improve the effectiveness of international safeguards, and provide greater assurance that clandestine weapons activities will not jeopardize regional stability, or world peace and security.

Over the past five decades, the United States has learned many lessons about managing nuclear technology and materials in a secure fashion. We are most willing to share some of our insights with South Africa and believe we would benefit from your experience, as well. In fact, I understand that as a result of discussions at the Gore-Mbeki Commission, our two governments agreed to hold a bilateral conference here in South Africa to develop some of those cooperative activities. NRC intends to be actively involved in those efforts.

CONCLUSION

I hope my remarks today have responded to the interests your Council outlined in its kind invitation to deliver this lecture. Obviously I have only been able to skim the surface of some of these topics. But my purpose in these comments has been neither to pose, nor to answer all questions. Rather, it is to provide a context for further meaningful mutual relations between our two countries in the important area of nuclear safety and security. I am very interested in understanding better South Africa's needs and aspirations regarding your nuclear program. In the next few days I shall be getting a first-hand look at some of your facilities, as well as speaking with people both inside and outside government who are involved in the nuclear energy field. As I said, I believe we have opportunities for significant cooperation in the future. Identifying those opportunities will come from an active and open dialogue between our two countries. I very much have enjoyed participating in that dialogue through this lecture here in Pretoria today.

NGIYABONGA (Zulu)

ENKOSI (Xhosa)

KELEBOGA (Sesotho)

DANKIE (Afrikaans)

THANK YOU